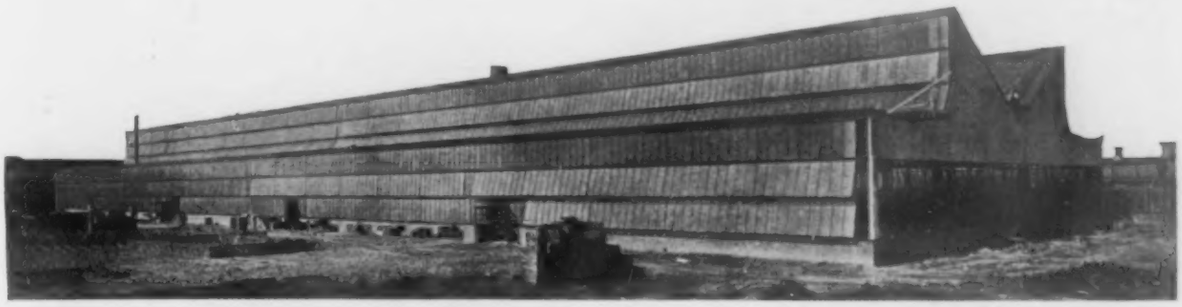
THE IRON AGE

New York, July 19, 1917

ESTABLISHED 1855 VOL. 100: No. 3



Stove Plate Foundry of a Modern Design

Cleveland Co-operative Stove Co.'s Interesting Type of Building Designed to Provide Excellent Working Conditions

A MOLDER'S efficiency is increased by good working conditions, and in times when labor is scarce a plant that is thoroughly modern and pays particular attention to its working conditions will fare better in securing a labor supply than one where little is done to make the plant a pleasant place in which to work. This was the predominating idea in laying out the new foundry of the Cleveland Co-Operative Stove Co., Cleveland, the designing engineers carrying out the general plans of John H. O'Brien, president and general manager of the company, whose long practical experience in the foundry industry started with his entering the plant as a boy in the shipping department and climbing by successive steps until he became head of the company.

The new Co-Operative Stove foundry is a light gray iron shop that is an unusually fine example of the modern type of foundry construction. It is designed especially for stove plate work and the making of various other stove parts, and is arranged for the convenient handling of material and economic production. As a part of the plan to provide good working conditions for the men the plant was laid out to assure an abundance of light and ventilation. Practically the entire outer wall surface is glass in hinged sash that swing outward in long sections for ventilation.

The Interior of the Foundry with the East Bay and the Battery of Air Squeezers in the Foreground and the Cleaning Department at the Right

Interesting features of the plant include the design of the building, wide molding bays and a wide gangway or aisle that extends through the center of the building for its entire length. The plant was laid out with a view of providing an abundance of floor space and preventing crowded floors that are found in many foundries, and that this has been accomplished is indicated by the views of the foundry floor as shown in the illustrations.

Another departure from the usual type of foundry is the use of a concrete floor. Shoveling molding sand from a dirt floor results in an unevenness, and many of the molds do not stand on a level. It was mainly to assure an always level floor that concrete was used, although the fact that a concrete floor would be better for the operation of electric tractors for handling material and castings was also given consideration. While an electric tractor is not yet being used in the plant it is the intention to equip it with one for handling purposes.

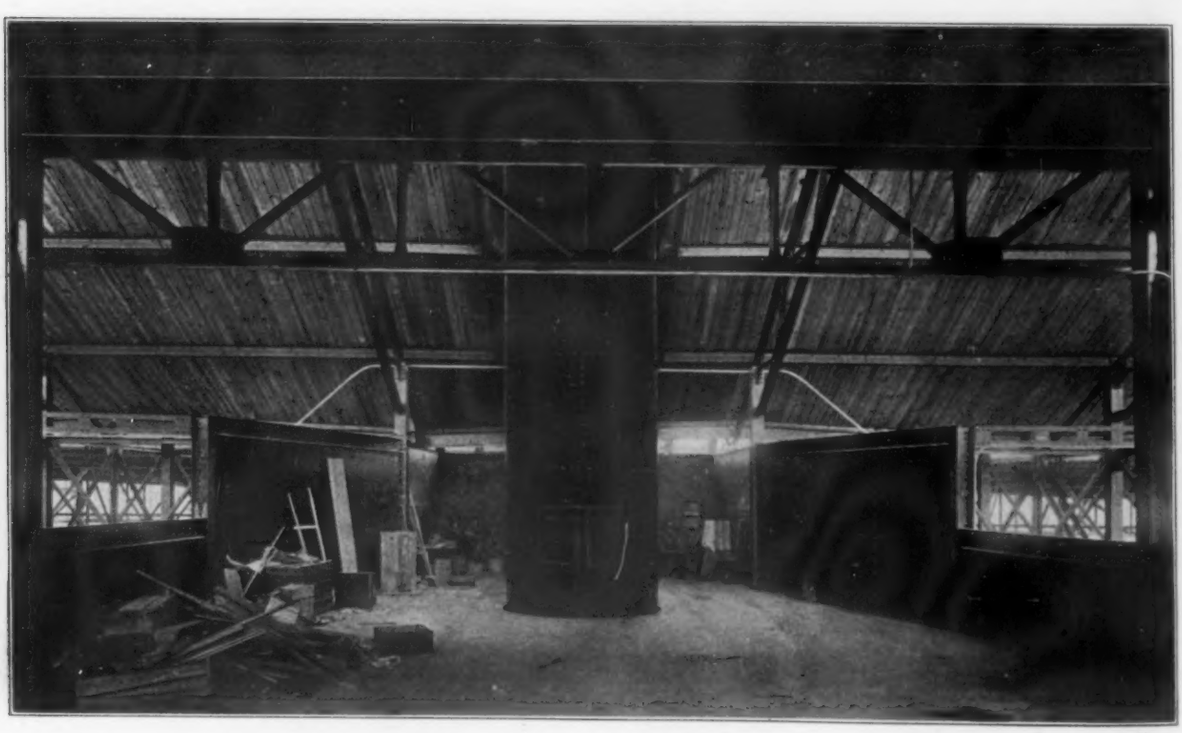
The foundry, which was placed in operation early in July, is located on Harvard Avenue on the Newburgh & South Shore Railroad. It has a daily melting capacity of about 40 tons of pig iron. The building is 450 ft. long and 135 ft. wide, of brick, steel, concrete and glass construction. Practically the entire floor is one large room, the only sections that are partitioned off being a small blower and compressor room at the side near the cupola and a small store and office room at one corner. From the foundry office on the second floor of the latter room a view may be had of the entire foundry floor. The company plans eventually to extend the building 550 ft., making a foundry floor 1000 ft. long. This extension will be made to permit the abandonment of its old plant in another section of the city, but until this is built the old plant will be operated.

The foundry building has a monitor roof of the Pond truss type, giving it the general appearance of two saw-toothed structures joined back to back. The design is clearly illustrated in the view of the exterior. An important feature of the roof design is that pockets in which smoke may gather without means of removal are, it is claimed, entirely eliminated. The building is divided into two bays 60 ft. wide by two rows of 8-in. building columns of the H-type spaced on 20-ft. centers and providing a 15-ft. center aisle or gangway extending the length of the building. The foundry is 16 ft. in height to the steel trusses, and 43 ft. in height to the peaks of the monitor. The width of the monitor is 66 ft. The monitor roof is in the form of a V, the two sides meeting in a valley above the center of the building.

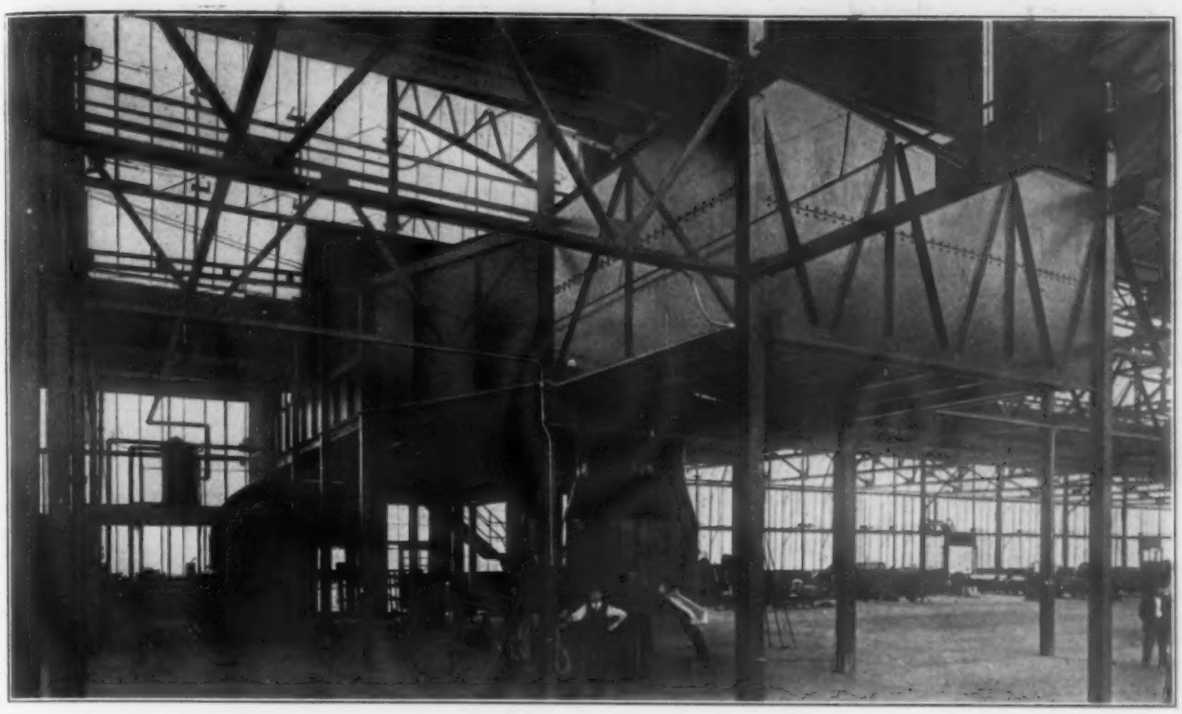
Practically one-half the floor space is used for bench and machine work. These two departments occupy the entire east bay, with the exception of the core-making department, which is located at the lower end of this bay. Cores are baked in a battery of four six-drawer Sly core ovens. A large part of the west bay is used for floor work, the remainder being taken up with the cupola, cleaning department and blower house.

The molding machine equipment consists of 40 Nos. 74 and 75 Osborn plain air squeezers of the sand straddle type, being mounted on wheels and pushed back and forth across the foundry floor by the molder. Each machine molder has a floor space 60 ft. long, or the width of the bay, and 6 ft. wide. The molds are made between 7:15 a. m. and 2:15 p. m., each during that time using the sand the length of his bay. The rest of the day is spent in pouring and shaking out the castings and placing them in the adjoining gangway for removal to the cleaning department. If it is found that their daily production can be increased the individual bays will be made wider and the supply of sand for each machine and each man's molding floor space will be increased. Hand ladles of 30-lb. capacity are used for pouring.

The air-supply line extends along the bay in the roof trusses and air is carried down to each machine by a hose of sufficient length to permit the travel of the machine from one side of the bay to the other, or the length of the molders' floor. The machines are equipped with closing benches and riddle racks, making them practically travelling benches. The two sizes of machines will take flasks



A View of the Charging Platform from the Front Looking Toward the Coke Storage Bin in the Rear



The Cupola Is Located Well Out in the Foundry, with Its Spout Reaching into the Gangway, and the Large Charging Platform Extends Beyond the Cupola Across the Gangway, Thus Providing Large Storage Space for Coke

30 and 32 in. long and of any width required. They are used for all small work that can be put on a power squeezer. Match plates are used in making a portion of the machine molds. Sand is cut on a cutting machine supplied by the Sand Mixing Machine Co.

The plant is equipped with an 84-in. Sly cupola, located an equal distance from either end. This cupola is placed nearer the center of the floor than in most foundries, being set so far out from the side that the pouring spout reaches out into the gangway, making it more convenient to handle the metal than if the cupola is located back near the outer wall. The cupola has a special tuyere of the Zippler type. The charging platform is unusually large, being 60 ft. long and 30 ft. wide. It extends several feet beyond the cupola and clear across the gangway. Coke is stored on the section of the charging platform beyond the cupola, the extension to this platform providing a storage space for about 2 carloads. With a large storage section in front of the cupola the charging platform has room for holding enough pig iron, coke and limestone to charge the cupola for about a week. The cupola is provided with two charging doors on opposite sides, the one at the rear facing the coke bin being used exclusively for charging coke. Coke is shoveled into steel charging boxes of 50-lb. capacity from which it is dumped into the cupola.

The charging platform is built of concrete, 4½ in. in thickness covered with ½-in. steel plate, and steel plates are used for the sides. The floor plate is set in with flat-head countersunk screws, affording a smooth surface for shoveling. Pig iron and other charging materials are taken to the charging floor on an Otis elevator with an 8 x 8-ft. cage and the cupola is charged by hand. The cupola is lighted by a Mahr Mfg. Co. oil lighter using fuel oil. A Sly cinder mill is located adjacent to the cupola. The cupola drop, instead of being taken to the mill in wheelbarrows, is dragged from beneath the cupola to the front of the mill by two hooks attached to a windlass, and from there is shoveled into the mill. Blast for the cupola is supplied by a No. 6½ Root's positive pressure blower, and air for the molding machines is furnished by an Ingersoll-Rand 10 x 12-in. compressor which maintains a 100-lb. pressure on a storage tank above the blower house. The blower and compressor are each driven by a 50-hp. Lincoln electric motor.

The cleaning department is equipped with 24 Sly tumbling mills arranged in groups of six driven from motors on the floor, chain drive being provided from the main shaft to the individual machines. The mills are both circular and round and in various sizes for different classes of work. Grinding is done on four double-wheel machines supplied by the Bridgeport Safety Emery Wheel Co. The current for driving the cleaning equipment is carried down in metal conduits from the roof trusses. The tumbling mills and grinding machines are to be connected to an exhaust system that is being installed by the Ohio Blower Co., Cleveland. Dust will be drawn from the machines by a 70-in. fan and discharged above the roof.

The building has brick sidewalls 4 ft. high, and above that is continuous window space in steel sash of the Pond type. There are three swinging sash sections hinged at the top in the side walls, and three similar sections in the monitor. As the sashes swing out at the bottom they form an awning and can be opened for ventilation in any weather and the draft of air is well above the workmen's heads. As many or as few window sections can be opened in any part of the building as desired, depending on the direction and force of the wind. The sash are 70½ in. wide and are glazed with ¼-in. factory ribbed wire glass. They are counterbalanced for ease in opening and closing by the operating mechanism. Some sash sections are 200 ft. in length and others are divided into 50-ft. operating groups.

The concrete foundry floor is 6 in. in thickness, a special type of hardened floor being provided in the gangway and around the cupola where hard service is required. The roof is covered with 2 x 6-in. tongue and groove boards over which is laid slate surface roll roofing.

The Molding Machine Bay of the Foundry and the Molds Made in One Morning

While artificial lighting will not be needed much of the time, an abundance of interior light will be provided when required. In each 20-ft. bay space as marked by the building columns, two electric lamps of ample capacity will be suspended and a row of lamps will be provided in the gangway to supplement those in the bays.

Coke, sand and limestone are stored in two long brick and steel sheds located along the cupola side of the foundry, being separated from the main building by a 20-ft. paved runway. These are duplicate buildings 104 ft. long and 28 ft. wide, the sections occupied by the coke bins not being covered. Five doors open from the side of each storage building, and three doors are provided along the side of the foundry for wheeling in sand. Sufficient storage space has been provided so that enough sand can be placed in the bins in the late summer to last all winter. Between the sand houses space is provided for the storage of pig iron. A railroad siding runs the length of the yard along the outer side of the sand and coke bins, making it convenient for unloading material.

A very complete service building is located at the side of the foundry in a line with the storage buildings. This is 91 ft. long and 28 ft. wide, of brick and steel construction, with a concrete floor. It includes lavatories with modern equipment, toilet rooms, six shower baths and a dryer room. The latter will be provided with steam pipes, along the side of which the men will hang their damp working clothes at night. Steel hooks will be furnished in this room for street clothes, lockers being eliminated as not being as easy to keep free from vermin. The dryer room is given a thorough cleaning every day. Inclosed toilet facilities are provided in the foundry at convenient points along the gangway, and drinking fountains are located at various places throughout the foundry.

The plant was designed by George S. Rider & Co., consulting and designing engineers, Cleveland. The steel sash equipment was furnished by the David Lupton's Sons Co., which also controls the Pond type of monitor roof used.

Will Systematize Shipments

WASHINGTON, July 17.—The General Munitions Board has decided to establish special terminal facilities at several of the largest Atlantic ports for the orderly, rapid and careful loading of vessels with munitions and supplies required by our armies in Europe and those of the allies. For this purpose, a special advisory committee on terminal facilities has been named, as follows:

Francis L. Stuart, consulting engineer (formerly chief engineer of the Baltimore & Ohio Railroad), chairman, who represents the port of Baltimore.

B. F. Cresson, consulting engineer, 50 Church Street, New York City, designated by the State of New Jersey to represent the New Jersey sections of the ports of New York and Philadelphia.

R. A. C. Smith, dock commissioner of the city of New York, and Charles W. Staniford, chief engineer of the department of docks and ferries of New York City, designated by the mayor of New York to represent that city's water front and the port of New York.

J. B. Locke, secretary of the Newport News Chamber of Commerce, designated by C. B. Garnett, chairman Virginia State Corporation Commission, and Mayor Moss of the city of Newport News.

W. A. Cox, secretary and traffic manager of the Norfolk Chamber of Commerce, designated by C. B. Garnett, chairman Virginia State Corporation Commission, and Wyndham R. Mayo, mayor of Norfolk, Va.

The representatives of the ports of New Orleans and Boston will be announced hereafter. The committee will at once begin consideration of its problems.

M. L. Cooke, chairman of the subcommittee on storage facilities of the General Munitions Board, at whose instance the special advisory committee has been named, states that the solution of the problem of special terminals will eliminate unnecessary freight hauls, releasing more cars and locomotives to transport the commerce of the country and greatly increasing our ability to keep our troops in France fully supplied with every form of war material.

The Fertel-Dangler-Wilson Co., Cleveland, dealer in iron, steel and metals, at its annual meeting July 10 elected the following officers for the ensuing year: C. S. Dangler, president; F. B. Dangler, M. H. Wilson, Jr., and A. A. Murfey, vice-presidents; S. Fertel, treasurer and general manager; W. E. Fertel, assistant treasurer; I. F. Freiberger, secretary.

ALTERNATING TORSION TESTS*

Improved Machine for Testing the Toughness of Steel and Non-Ferrous Metals

BY D. J. McADAM, JR.

IN the proceedings of the Society for last year a description was given of an alternating torsion testing machine developed at the U. S. Naval Engineering Experiment Station, Annapolis, Md. In this article there were also given some endurance tests on various kinds of steel. It was stated that experiments were baing made in testing non-ferrous metals and alloys by the same method. In the testing of very ductile material, however, difficulties were encountered, necessitating important additions to the machine. The present article describes the modified machine.

The illustration shows a sketch of the machine showing end and side views. In this figure, *K* and *J* represent the worm gear and driving wheel of the machine. The arm *B*, which is caused to oscillate by means of its eccentric attachment to the rotating wheel *A*, gives alternating rotation to a shaft passing through the bearing *C*. This shaft is attached to one end of the helical spring *D*. To the other end of the spring *D* is joined a shaft that passes through the radial and thrust ball bearing *E* and is fastened to one end of the test specimen *F*. From the other end of the specimen *F*, a shaft passes through the radial ball bearing *G*, and is fastened to the arm *H* which extends between the springs *I*.

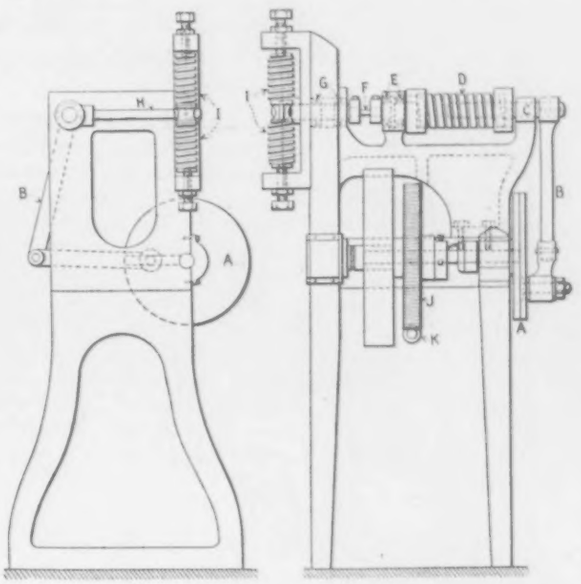
When, therefore, the arm *B* is caused to oscillate, alternating rotation is transmitted through the spring *D* to one end of the specimen F. Since this rotation is resisted by the action of the springs *I* on the arm *H*, an alternating torsion is applied to the specimen. The torsional stresses can be varied by varying the eccentric attachment on the wheel *A*.

As described in the previous paper, the torsional stresses are proportional to the displacement of the springs *I*. The amount of displacement is indicated by a magnifying pointer, not shown, adjusted to the end of the arm *H*. The arrangement of the pointer and recording drum is shown in the illustration in the previous paper. A counter records the number of cycles of stress applied. A comparison of the illustration in this paper with that of the previous paper will show that the chief modification of the original machine consists in the addition of the spring *D*, the purpose of which is as follows:

If this spring is omitted and the arm *B* connected by a shaft with the specimen *F*, the machine could be used satisfactorily in the testing of steel. For very ductile material, however, such as non-ferrous metals, the machine would not be satisfactory. As the ductile specimen yielded, the applied stress would soon drop almost to zero, and the specimen would last indefinitely unless the angle of rotation were increased. Any arbitrary increase, moreover, in the angle of rotation would, of course, make the test indefinite and worthless. The object of the spring, then, is to take up the torsional strain of the specimens as the yield takes place.

Suppose, for example, the eccentric attachment of arm *B* is adjusted so that the angle of rotation of the shaft in the bearing *C* is 5 deg. on each side of the neutral position. At the beginning of the test, the angle is usually distributed through the system so that most of it occurs in the spring *D*, while the torsional strain of the specimen *F* might be only a fraction of a degree. As the specimen yields, however, the torsional strain of spring *D* decreases while that of specimen *F* increases to the maximum angle (in the supposed case, 5 deg.). By use of a long helical spring, therefore, the torsional angle of the test specimen may be automatically increased as the test proceeds, while the torsional moment is held nearly constant until a very short time before fracture occurs.

As a further improvement in the use of this machine, a system of magnifying pointers is to be attached at each end of the speciment *F* and at each end of the spring *D*. By the relative motion of these pointers and by the motion of the pointer attached to the arm *H*, a complete record of the angle of torsion of the specimen, and of the torsional moments applied by springs *D* and *I*, may be obtained.



Two Views of the Alternating Torsion Testing Machine

Since the above described improvements have been but recently added to the machine, very few tests on non-ferrous metals have been completed. Preliminary experiments, however, have shown that the machine in its improved form will be useful in testing the toughness of non-ferrous metals as well as of steel.

*From a paper presented by permission of the Secretary of the Navy, at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 27, 1917.

Separating Fine Gun and White Metal Borings

A new method for separating fine gun metal and white metal borings has been perfected by the chief chemist of New South Wales Railway Department. The old method was by liquation on an iron plate or in a furnace, which was satisfactory for coarse borings but quite useless for fine grades. The problem of the removal of the white metal in the fine borings has been solved. The small borings are passed to a magnetic separator, picked up by a revolving belt fitted with pockets, and conveyed to an overhead bin, whence they gravitate to classifiers and are separated into three grades. From bins 1 and 2, containing the coarser material, the borings gravitate to a short revolving belt, fitted with pockets, and are delivered into a bin above the furnaces. These furnaces are made of iron tubes, one fitting inside the other. The outer one, being several inches larger in diameter than the inner, is supported by means of brackets to the floor and carries in the intervening space between the two tubes a coil of iron pipe, with suitable sized perforations for heating the walls of the inner tube with gas. The inner tube revolves and the hot borings and liquid white metals pass into revolving screens, smaller in mesh than the last classifier, and the liquid white metal escapes through the screen into an outer surrounding vessel, heated by a gas coil. In this way the white metal does not cool, but collects at the bottom, and can be run into molds. The clean borings pass along the screen on to a hand truck on wheels and are taken to the foundry, melted, and used for ordinary gun metal castings. Each grade is treated separately.

The Pennsylvania Railroad Co. is arranging for the construction of 2000 all-steel box cars and 200 all-steel cabin and flat cars at its Altoona (Pa.) shops for delivery after Jan. 1. It is said that the work will keep the shops operating at full capacity well into 1918.

Goethals' Great Shipbuilding Program

Starting Is Delayed by Letter from Chairman Denman—Order of the President—Ships Building and Proposed

WASHINGTON, July 17.—In an executive order issued July 11, President Wilson, it was thought, brought to an end the controversy between Chairman Denman of the United States Shipping Board and General Goethals, general manager of the Emergency Fleet Corporation, as the former was given authority to operate vessels required by the board, while to the latter apparently was given the broadest powers in regard to the construction of vessels, the purchase or requisitioning of those in process of construction for private account and the purchase or requisitioning of all materials for ship construction. Later developments indicated, however, that the controversy between Denman and Goethals had not been settled. The President's order was as follows:

EXECUTIVE ORDER

By virtue of authority vested in me in the section entitled "Emergency Shipping Fund" of an act of Congress entitled "An Act Making Appropriations to Supply Urgent Deficiencies in Appropriations for the Military and Naval Establishments on Account of War Expenses for the Fiscal Year Ending June 30, 1917, and for Other Purposes," approved June 15, 1917, I hereby direct that the United States Shipping Board Emergency Fleet Corporation shall have and exercise all power and authority vested in me in said section of said Act, in so far as applicable to and in furtherance of the construction of vessels, the purchase or requisitioning of vessels in process of construction, whether on the ways or already launched or of contracts for the construction of such vessels and the completion thereof, and all power and authority applicable to and in furtherance of the production, purchase and requisitioning of materials for ship construction.

And I do further direct that the United States Shipping Board shall have and exercise all power and authority vested in me and in said section of said act, in so far as applicable to and in furtherance of the taking over of title or possession, by purchase or requisition, of constructed vessels, or parts thereof, or charters therein; and the operation, management and disposition of such vessels, and of all other vessels heretofore or hereafter acquired by the United States. The powers herein delegated to the United States Shipping Board may, in the discretion of said board be exercised directly by the said board or by it through the United States Shipping Board Emergency Fleet Corporation, or through any other corporation organized by it for such purpose.

(Signed) WOODROW WILSON,
President.

The White House,
July 11, 1917.

Believing that he had been given full authority to proceed, General Goethals lost no time in doing so and on July 13 sent the following letter to Chairman Denman:

General Goethals' Letter

Now that the President has authorized the Emergency Fleet Corporation to exercise the powers granted by Congress to build and commandeer ships, I intend, on Monday, to start ship construction which will complete my shipbuilding program. My full program is as follows:

1. *Ships now building:*

Contracts for 348 wood ships have been let, or agreed upon, with a tonnage capacity of 1,218,000 tons, at a cost, completed, or approximately $174,000,000.

In addition, I have under negotiation contracts for about 100 wood ships.

Contracts for 77 steel ships have been let, or agreed upon, with a tonnage of 642,800 tons, at a cost of approximately $101,660,356.

There are thus provided 425 ships of all sorts, with an aggregate tonnage of 1,860,000, at a cost of approximately $275,000,000, besides 100 more wood ships under negotiation. I shall continue to let all contracts for wood ships of design approved by the naval architect of the corporation which I can secure from responsible bidders.

NEW GOVERNMENT SHIP PLANTS

2. *Construction of standardized ships:*

My main reliance for getting the greatest amount of the most serviceable tonnage in the shortest time will be on the construction of fabricated steel ships of standard pattern. For that purpose I shall use, to some extent, the existing yards.

On Monday I shall offer contracts for the building of two plants (to be owned by the Government) for the construction of fabricated steel ships, to produce 400 ships of an aggregate tonnage capacity of 2,500,000 tons within the next eighteen to twenty-four months. For the building of these two yards and the construction of ships in them I shall offer as compensation to the agents who undertake the work a fee of approximately 6 per cent of the total cost of the work, with rewards for savings in cost and for speed in delivery. Provision will be made for decreasing the fee to prevent unnecessary cost. The contracts will give the Government the benefit of Government fixed commodity prices, and will provide for cessation of work at any time, so that the appropriation may not be exceeded. Options will be given to the contractors to purchase the plants at arbitrated values on the completion of the work.

The design of the ship is ready, the plans of the yards are ready, the distribution of the work of furnishing the material and of fabrication is arranged.

This part of the program will take all the $550,000,000 available not absorbed by contracts made or making, as stated at the beginning of this letter. The program will more than redeem my estimates to the Congressional committee at the time this appropriation was asked for, of 3,000,000 tons of new construction within eighteen months.

The additional contracts for wood ships which I expect to place, together with the full number of fabricated steel ships which it is planned to build, will require more money than Congress has authorized. When I know how much will be needed it will be necessary to ask Congress for further sums.

WILL HASTEN COMMANDEERING

3. *Commandeering of ships in yards:*

On Monday I shall deliver to ship builders a general statement of the program which I have long been maturing for commandeering ships now under construction for private account. (Such ships have an aggregate tonnage considerably in excess of 1,500,000 tons).

The essence of this program is to commandeer all such ships and expedite their construction by adding labor and cutting out refinements. By thus Federalizing each yard, giving it Government help and putting it on a speed basis, we shall produce its greatest efficiency. As fast as the berths are cleared, each yard will be devoted to the production of a single type of tonnage, for which it is best suited. I count upon the complete cooperation of the yards.

This program is made comprehensive because expedition cannot be obtained in a yard engaged partly on rush work and partly on pre-wartime schedules. My investigation has satisfied me that citizens of the United States and of our allies will pay the cost of expediting ships now building for them and take them off our hands. If this policy is adopted, it will conserve our fund.

I agree that it is essential for the Shipping Board to requisition at once the neutral ships which are constructed and ready to sail. I have no data to make an estimate as to how many of these ships there are or how much money will be required for this purchase. I shall, therefore, cut my program to the extent of $50,000,000. Please notify me at once whether this is enough.

Each day's delay in summer—in commandeering or contracting—means two days' loss of time in throwing the work into the winter months. It is for that reason I am urgent that the program start on Monday.

Will Federalize Shipbuilding

On Saturday, July 14, General Goethals made public the following statement:

It has been decided, after consultation with representatives of the shipyards, that the construction of steel merchant ships in all the shipyards of the United States must be hastened—

(1) By the addition of overtime where necessary.

(2) By proceeding to additional labor shifts as soon as may be, and

(3) By the elimination of nonessential refinements of construction and equipment.

It is necessary, also, that each yard increase its production to the maximum, and after the building berths are cleared of ships now under construction be devoted to producing the particular type of ship to which it is best suited.

Because of their varied contracts for shipbuilding, the yards can not carry out this program without the help of the Government; it has, therefore, been decided that the shipbuilding industry of the nation shall be federalized. All steel merchant ships now on the building berths will be forthwith requisitioned by the United States, and each yard will proceed to complete such ships under the direction of the general manager of the United States Shipping Board Emergency Fleet Corporation and will take on new work (other than repair work) only with his consent.

No ships under construction for the Navy Department or for any other Government department, or for the United States Shipping Board Emergency Fleet Corporation, and no ship repair work, will be requisitioned at this time.

It is the policy of the Government to make fair payments for the work done under this program, so that investment of private funds in the shipbuilding industry may be secured, and to encourage the training of men to work in that industry.

It is essential to the success of this program that the shipyards and the men employed in them co-operate with the Government.

The program contemplates that the yards under their present management will hire and pay labor and continue in charge of ship construction as heretofore.

For work done in carrying out this program the yards will be compensated on the following general basis:

(A) For work on ships now under construction the yard will continue to furnish, as its own expense, the labor and all materials (so far as not now on hand) necessary to complete the ships, and will be entitled to hold for its own account all payments heretofore made under the construction contracts, and to receive from the Government the balance of the contract prices on the dates and conditions provided in the contracts (with the following modifications):

1. The prices paid will be minus amount saved by elimination of nonessential refinements and plus additional expense of changes in specifications determined upon by the general manager.

2. In the event of any increase in the scale of wages at the yard after the date of federalization, such increase will be paid by the Government if it is found to be justifiable and is approved by the general manager.

3. The Government will pay the overtime allowance (over yard basis) on the cost of direct labor on any ship (or will adopt some other equitable basis as to the overtime expense).

4. In case the yard adds an extra shift it will receive a suitable allowance to cover the extra cost due to lower efficiency of night work under these conditions.

(B) For construction of new ships the Government will pay—

1. Approved material costs (the Government reserving the right to furnish materials).

2. Direct labor cost.

3. An additional sum to include other costs and a fair profit.

All moneys due the yards, except as herein otherwise provided, will be paid in installments hereafter fixed.

Direct labor cost will be exactly defined.

Arrangements for adjusting the payments already made to the yards by ship purchasers will be made by the Government.

Federalization of yards will end within six months after peace (subject to completion of ships under way).

If necessity arises, the Government, from time to time, may furnish sums, to be hereafter fixed, for plant and equipment, including the erection of laborers' houses and accommodations (to remain the property of and the income thereof to be received by the Government) on such terms and at such times as may be arranged.

Orders will be issued as soon as may be to each yard separately defining the application of this program to the particular yard. This statement is intended to show the general basis of federalization of the yards.

This statement of program is made under authority delegated by Executive order of the President, dated July 11, 1917, to the United States Shipping Board Emergency Fleet Corporation.

GEORGE W. GOETHALS,
General Manager United States Shipping Board Emergency Fleet Corporation.

The carrying out of General Goethals' plan was delayed at least temporarily Monday by the receipt by him of a letter from Mr. Denman, chairman of the Shipping Board, which owns all the stock of the Emergency Fleet Corporation of which General Goethals is general manager. Mr. Denman is understood to favor the Hough design for wooden ships. It is also a serious question over the price to be paid for the steel. Another point of difference relates to the method of commandeering ships.

Explaining the delay in General Goethals' announced commandeering of shipyards Monday, Chairman Denman said:

"We requested of General Goethals certain information concerning the program for expending the $750,000,000 of public money for which the President's order has made the Emergency Fleet Corporation and the Shipping Board responsible. If General Goethals' plans had reached the condition of preparedness it has been asserted they had reached, the information could have been furnished within two hours, or we could have been told that the information was not at hand. When we do receive the information in writing we will take up with General Goethals the discussion of all the matters involved in the project of building ships.

"What we want is a speedy construction of ships, a reasonable price for steel and ship fabrication, the retention of all alien tonnage on our stocks which may be necessary to carry troops to Europe if the rate of submarine sinkings continues even two-thirds as great as they have been during the five months ended July 1."

Germany's Industrial Outlook After the War

The German industrial outlook after the war was discussed at a recent general meeting of the Ilsede and Peine Steel Works by the president, Wilhelm Meyer, in the course of which he said, as reported by the London *Ironmonger*, that the future development of the German steel industry depended primarily upon the peace conditions. The payment of interest of the gigantic war loans and the provision of a sinking fund for their redemption would be a terrible burden, while enormous sums must be paid annually to the dependents of fallen soldiers and to unfit men. The question would be a good deal simplified if Germany should be able to insist upon the payment by her enemies of adequate war indemnities, but even in that event taxation was sure to increase. Germany's enemies were resolved to keep her out of the world's market after the war. But Germany was mainly dependent upon the exportation of her industrial products and in particular upon her large export trade with her present enemies. Nevertheless, Mr. Meyer declined to be despondent, and he expressly declared that he and his associates would not consent to a peace without annexations or indemnities. "In the land of militarism," he said, "everyone was taught from youth upwards to work and to do his duty in his appointed place. This would not only remain so but the call might be intensified, and while Germans worked and did their duty their enemies would not be able to conquer them in trade and industry. It was true that they had lost many markets through the war, but they would recover these, and recover them all the sooner if they were set free from the innumerable regulations and other fetters that had been imposed upon them during the war."

June Production of Dominion Steel

The output of the Dominion Steel Corporation, Sydney, N. S., for the month of June was as follows: Pig iron, 29,375 tons; ingots, 30,647 tons; blooms, 15,980 tons; shell blooms, 11,485 tons; shell bars, 4868 tons; rods, 10,000 tons; nails, 3534 tons.

As this is the first time output figures have been given out for a number of years it is not possible to make any comparisons, but they show a small advance over the same month last year. Pig iron output was slightly better than a year ago, while ingots fell off slightly.

Tongue and Ear versus Eye and Hand

A Fable for Official Washington but with a Moral for Business Conduct in General

BY DR. WILLIAM KENT

"DOCTOR, you've got to do something more for me," said the Boss of a great department in Washington to his physician. "I'm following your rules as to diet, exercise, sleep, rest periods, automobiles, golf and the like, and you say I'm in perfect mental and physical condition. I work steadily eight or ten hours a day vigorously, and I have a strong appetite for work, but I am worrying because the work is moving so slowly; things don't seem to get done, and the newspapers are pounding me about it."

"You ought to join the Don't Worry Club," said the doctor. "I'm already in it," replied the Boss, "and I know all their rules and mottoes by heart. 'Worry kills, work never does'; 'Worry never accomplishes anything'; 'Get busy and you will forget all your worries'; 'Rome was not built in a day'; 'Have patience, all these things will straighten themselves out if you only wait'; 'Haste makes waste'; 'We're farther ahead in two months than England was in a year'; 'We can't invent ourselves out of this war; all we've got to do is to keep on digging'; 'Keep business as usual, keep calm, don't rock the boat,' and so on.

"Well, I never knew worry to be cured by maxims and mottoes," said the doctor. "There are only two cures: 1. Remove the cause. 2. Substitute a stronger sensation, a counter-irritant, one that will be more real cause for worry, but which is so strong that worry is forgotten and action takes its place. Seasickness, for example, is a worry sickness, and a shipload of seasick people can be cured instantly by a rumor that the ship is on fire. In your case removal of the cause of your worry seems to be the proper remedy. As you say 'things don't seem to get done.' That's the cause; your worry is the effect. The remedy is get things done. But how? That requires first a diagnosis of your environment and your working conditions. I will have to ask you some questions. Have you any financial troubles?"

"No, thank heaven, Congress has granted everything I asked."

"Are your assistants, heads of bureaus, advisers, loyal, capable and efficient?"

"They are the best in the world; I could not ask for any better. Many of them are experts of world-wide distinction. They are all working hard, are overworked, in fact, and some of them are so patriotic that they are serving without pay."

"A great secretary of state once said that the greater part of his work was signing letters that he never wrote in answer to letters that he never saw. Is your work like that?"

"No, I keep in touch with all the work of my department. It is my duty to know what is going on. I am constantly in conference with my organization."

"You speak of your organization. Briefly what is it; how does it work; what is its efficiency?"

"First, there is my private staff, which I call my cabinet. The chief, a most able man, is my understudy, who could take my place if I were to drop out. The next is his understudy, who could take his place. Then we have bureaus, each with an expert superintendent, which are in charge of executive duties. We have also functional foremen for each branch of the service. These bureaus prepare contracts, specifications, methods of inspection and tests, advertising, look after raw material, machinery, labor, transportation, delivery, storage, forwarding and the like. Besides these we have a legal bureau, whose duty is to assist in preparing contracts and to see that we do not violate any law, and an accounting bureau which sees that all the money spent is accounted for, keeps cost accounts, and makes out vouchers and reports for the Treasury Department. Then we have a consulting board, an advisory board, an emergency board, a research board, and a planning board, and for each of these we have all the necessary outfit of stenographers, typewriters, filing and correspondence clerks. We have an excellent organization, thoroughly systematized, and every man in it seems to be doing his work faithfully, and with patriotic enthusiasm. As to its efficiency, the work is so vast and the responsibility so tremendous, that we have as yet no standards for measuring efficiency, and therefore cannot state it in percentages, as some of the efficiency engineers do."

"What work do these several boards do?"

"They have meetings, they consult, confer, advise, plan things to be done in the future, near and distant, correspond, receive suggestions, turn them over to committees of study and report, and they frequently have conferences with my cabinet and myself and make verbal and written reports of their opinions and conclusions. They are composed of most excellent men, professional men and inventors of the highest standing, and of course they cannot be hurried."

"Of course not; boards never can. As General Goethals says: a board is long, narrow and wooden. Now I want to ask you about your own work; what do you do all day?"

"I get to the office at 8.30, and my secretaries who have been there since 7.30 hand me those letters from the early mail that they think I should see, having themselves dictated answers to all those of a routine or unimportant nature, or else marked on them the symbol of the form letter with which the typewriters answer them. From 8.30 to 9.30 I put my answers on the dictaphone. Then I get rid as quickly as I can of the callers for whom appointments had been made by my secretaries and of the morning's callers whose cards have been allowed to get as far as my room. From 11 to 1 and from 2 to 4 I am in conference with heads of bureaus and chairmen of boards. From 4 to 4.30 I glance over my afternoon letters, dictate replies to a few of them, receive a few more callers to 5 o'clock, when my automobile takes me to the golf ground. I try to leave all my business in the office, but often some one catches me at the golf club and I have to drive him home with me talking business on the way; sometimes a conference is held in the evening, and then I am apt to lie awake in bed an hour or so planning out things to be taken up in conferences the next day."

"Thank you. I think I have diagnosed your case. No wonder that you are worried because things don't get done, and no wonder that things don't get done the way you and your boards are trying to do them. I am now going to give you a scientific lecture and a prescription, which I don't suppose you will take; therefore I am going to ask you to put a dictaphone on this table and to give me a few typewritten copies of what I say, so that I may use them on some other Government officials who are in the same condition as yourself, and possibly use one of the copies as the basis of a paper to be presented to the medical society, entitled "The Tongue and the Ear versus the Eye and the Hand."

The dictaphone being placed, the doctor proceeded as follows:

"What you and the Government are trying to do is to get things done, in other words to do useful work. In the engineer's language work is the expenditure of energy, the overcoming of resistance through space. The work to be done in this war is chiefly mechanical engineering, and the work of the mechanical engineer consists largely in changing the location and changing the shape of material things. He takes iron ore and coal from the ground, uses them to make steel, which he forges into guns and shells. He moves them to the battlefield in France, where the shells are moved from the guns into the enemy's trenches, causing a rearward movement of the enemy's forces. He takes cast iron, wrought iron, steel, copper, mica and shellac, puts them into certain shapes and makes them a wonderful structure, co-ordinated and harmonious, called a dynamo or electric generator, into which he puts horsepower obtained from a steam-engine, and from which he obtains kilowatts of electric current, to be utilized in driving all kinds of machinery. The work or energy put into the shaft of the dynamo in a given time by the steam engine is called the input; the work it gives out, that is, the useful work, is called the output, and the ratio of the latter to the former, it may be from 50 to 90 per cent, is called the efficiency. But the dynamo does other work besides making electric current. It makes useless friction, hysteresis, eddy currents and hot air; these constitute the wasted work or losses, and they may amount to 10 to 50 per cent of the input, according to the construction or organization of the dynamo and according to the relation that exists between the capacity of the dynamo and the work that it is given to do.

"The increase in the number and in the variety of things that an engineer has to do has in recent years led to the subdivision of the profession into many branches. The latest development in this line has produced what are known as industrial or organizing engineers. Their work has largely to do with the human element, and they have made a new definition of engineering,

the science and art of overcoming the resistances of nature, including human nature.

"They do, or try to do, the planning, while the other engineers, civil, mechanical, mining, electrical and chemical do the performance. They try to organize, co-ordinate and harmonize business and engineering, and to get things done promptly and at minimum cost. Their branch of the profession is a new one; they have not yet developed the standards and the precision of methods that the other branches have. Efficiency is their watchword, and they have done great things in measuring the efficiency of machines and of labor, and in increasing production, but their own methods are in many respects very inefficient.

"But industrial or organizing engineers are not to be condemned as a class because some of them, or even a majority of them, are sufficient. They are as necessary in the present age as lawyers and surgeons are, and there are but few great lawyers and few great surgeons. There are a few great industrial engineers in this country and the thing to be done is to discover them and put them into positions of authority. They may not be known in the engineering profession; they may be business men, surgeons or lawyers, but they must be geniuses of organization, and know how to select their co-workers and subordinates. Rockefeller and Carnegie were not engineers, Elbert H. Gary and Lloyd George were lawyers.

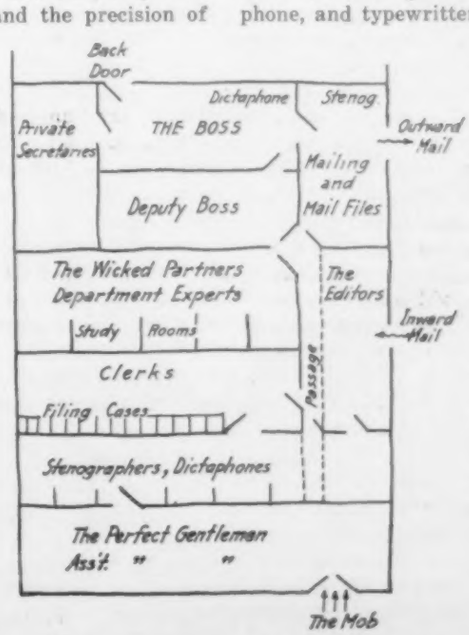
"The great organizer is not necessarily a great man or a superman. He needs a normal brain, good common sense, no great conceit of his own ability, no special expertness in details, no great hunger for work twenty-four hours a day, but he must have a knowledge of human nature, a judgment of character, a willingness to entrust details to other men, more capable than himself in handling them, and a determination to conserve his own powers and not overwork himself, so that he may have time to do calm thinking. He must not allow his time to be taken up in useless talking or conferences or arguments. Physically he is an ordinary man, receiving his brain impression through his eyes and ears, and conveying his impressions to others by his tongue and his pen. He realizes the fact that his ears and those of other people are less efficient means of obtaining knowledge than his eyes; that his and other peoples' memories of information received through the ear are faulty, that he remembers better what he sees than what he hears. He realizes also that when he uses his tongue, what he says may go in one ear of the hearer and out of the other, and that if he wishes his words to be most effective he writes them out with a pen in his own hand, rather than confiding them to a stenographer or a dictaphone. Paraphrasing Richelieu he says, 'In the hands of men entirely great the pen is mightier than the tongue.'

"His subordinate verbally makes a suggestion. He says, 'That sounds all right. Just write it down on a piece of paper, and boil it down to ten words. Put it in the basket on my desk and I will consider it.' He wishes to consult a lawyer. Instead of requesting a conference, he writes out the question in the fewest possible words and sends it to him, asking for a written answer.

"He wishes to hold a council of war, in which free use of the tongue will be permitted, but he writes out the question at issue, sends a copy to each of his staff, and asks them each to bring an answer in writing to the meeting, and be prepared to defend the answer orally.

"Knowing that spoken language is an imperfect means of conveying thought and that hearing spoken language is an imperfect means of receiving thought, he has the words spoken at the council taken by a dictaphone, and typewritten copies of them and the written answers given to each one present, so that each one may use his eyes and his pen in correcting and editing his spoken words, striking out all unnecessary verbiage, and in studying and making notes on the answers and the discussion of the other members. He appoints a committee of two to study all the corrected and annotated manuscripts and to draft a report for final action by the council, which report is submitted at a second meeting of the council held a few hours after the first meeting if quick action is needed, at which it may be discussed, amended, voted on, and, if passed, approved and acted upon.

"Note that in this council of war the organizer, the chief or boss, does not need to use his tongue or even his brain. He



The Doctor's Prescription to Relieve the Executive

has propounded the question, and he gets each of the staff to exercise his own brain upon it, and makes a committee of only two men do the real hard work of digesting, co-ordinating and harmonizing the several opinions and preparing the final report. He is an 'easy boss,' but he is easiest on himself; he conserves his brain energy by not allowing his ears to be bombarded nor his tongue to bombard the ears of others. He has a well-oiled machine, his organization is an efficient dynamo that turns out a maximum of useful current and a minimum of friction and hot air. He makes the other men do the work, so that when the time comes for him to pass judgment upon it and accept the great responsibility of signing his name to it, he can do it calmly with a clear brain.

"Now, Boss, I've diagnosed the disease of yourself and of your whole organization. Can't get things done. Brain fag, due to excessive vibration of the gray matter, caused by vibration of the ear drum and by pulsations of the tongue. Over-production of hot air. Now for the prescription. Put cotton in your ears and in those of your staff and boards for five or six of the working hours of each day. Become for these hours deaf and dumb. Stop using your ears and your tongue, and use your eyes and your pen instead. You may, however, talk to your dictaphone, for it can't talk back to you and vibrate your ear drums. But remember that over-use of the dictaphone tends to verbosity; therefore, use your eyes and your pen to boil down the typed copy of your dictation. If you will take this prescription and use it faithfully, things will get done and you will get rid of your worry."

The Boss agreed with the doctor in his diagnosis. "I am going to try your prescription," said he, "but I am afraid it will go hard with my staff and boards. It would disrupt their whole system. Just look at this diagram of the system. Here are a lot of circles representing the several branches of the service, and the links connecting them show how information proceeds from one to another passing through my office on the way. The diagram looks rather complex, but it is simpler than it looks. There are some short cuts, for getting rid of some of the red tape, that we use in the acutal working of the system, which are not on the formal diagram."

"I have seen a good many diagrams of business organizations, but this is the worst I ever saw," observed the doctor. "Here I will sketch a diagram for your organization. At the top I put you in a room by yourself, where you are protected by numerous barriers against intrusion. There is a back door through which you may escape, and through which you may admit some personal friend who has your private countersign. Next is the room of your deputy who does all your routine work and who has your rubber stamp. In front of his room is a large room and a series of small rooms for the men who do the real work of the department. They are the same men who are now your staff and your advisory boards. Each man is an expert in some one or more specialties. They do not work as a board, long, narrow and wooden, but as individuals or partners, each high-brow expert having a wicked partner and an understudy. Every report, conclusion or opinion coming out of this room must be signed by at least two men, as a precaution against the bulls or blunders that are apt to be made by a man temporarily afflicted with brain fag.

"At the bottom of the diagram, the front of the building, is a large room devoted to the Perfect Gentleman and his assistants, and connected with it are several small rooms for stenographers and dictaphones. The mob, men with inventions, suggestions, complaints, etc., are welcomed in this room with the utmost courtesy, affability and diplomacy. They all want to see the old man, or the Boss, and take up his time talking to him, but they don't see him, at least not that day, unless they bear introductions from the President or from some foreign ambassador or can give the Boss's countersign. 'Ah! I'm very sorry, but the Boss's calendar is filled up for every minute of this day, and he cannot see any one. Perhaps, if the matter is of special importance I can arrange an appointment for to-morrow.' 'Well, if I can't see him, perhaps I can see Mr. Blank,' naming one of the chief experts. 'Ah! I'm sorry, but he is exceedingly busy and has left word that he cannot be interviewed to-day. The only way to get at him is by correspondence. If you will kindly step into one of these small rooms you will find a dictaphone, or a stenographer, if you prefer, and you can have a letter to him typewritten at once, and he will get it just as soon as he is disengaged.' So the letter is written and signed, and the applicant departs after receiving assurance that a reply to the letter will be mailed to him the next day. The letter does not go to the expert, but to the editor's room, where one of the editors who is familiar with the subject dictates an abstract of it, boiling it down as much as possible, adds to the abstract a note to the effect that the invention, or suggestion, or complaint, is practically the same that was made by A. B. on April 30 and by C. D. on May 2, file Nos. 7468 and 8214. The expert gets the abstract, shows it to his partner and his understudy, they agree as to its contents, and as to the reply to be made to it, and it is sent back to the editor with the note, 'Answer same as 8214,' initialed by the chief expert.

"The editors edit the incoming mail in the same way, relieving the experts of the labor of reading a lot of useless verbiage, and of dictating letters which are only duplicates of those that have been written many times before.

"Contracts and other important matters requiring executive action are completed by the experts and editors and made ready for signature before they reach the rooms of the deputy boss. He examines them, and lays them before the Boss with the words 'Please sign here.' How do you like my diagram?"

"I like some parts of it," said the Boss, "especially the wicked partners, the editors and the perfect gentleman, but I don't like what you've done with me. You've taken away all my work, you've reduced me to a nonentity, a rubber stamp. You've relieved me of all responsibility and all authority."

"Not at all. You have all the responsibility and authority you ever had. You have the responsibility of selecting your co-workers and subordinates, of assigning them to their several duties and of holding them responsible for results, for getting things done, leaving them unhampered by your interference with details. Why do you want to do any work that you can hire other men to do better than you can do it? Now, I don't want you to introduce this scheme to your organization. Just write the heads of your several boards, enclosing a copy of your present diagram and asking them if it cannot be improved in some way that will lessen your work and their own in attending conferences, in listening to arguments, in using their tongues and their ears. Suggest a competition among them in inventing some workable scheme, and I would not be surprised if they finally arrived at some such diagram as I have sketched out."

"Thank you, Doctor. I am going to take your whole prescription."

The Cleveland Cliffs Iron Co., Ishpeming, Mich., is having plans prepared by M. J. Strum, architect, 116 South Michigan Street, Chicago, for an $85,000 hospital and infirmary building at its mining headquarters in Ishpeming. The building will be 50 x 150 ft., three story and basement, fireproof, and contain a complete new equipment.

TWENTY THOUSAND AIRPLANES

House Committee Reports in Favor of Appropriating a Very Large Amount

WASHINGTON, July 17.—The project to provide the American forces in France with an immense fleet of airships was fairly launched when the House June 13 unanimously passed a bill appropriating $640,000,000 for this purpose. It is the expectation of the Administration that this entire sum will be expended during the coming 12 months, and that if the war continues beyond 1918, a large additional fund will be provided. Not less than 20,000 airplanes will be constructed as speedily as possible, each equipped with two complete engines and armed with from one to three machine guns. The bill authorizes an aviation service of approximately 75,000, including officers, trainers, student fliers and enlisted men.

Notwithstanding the fact that the bill has been exhaustively discussed in committee, the House was asked to pass it without any detailed explanations concerning the character of the airplanes that are to be built and the Military Committee will vouchsafe no detailed reasons for seeking the very large appropriation carried by the measure. The hearings before the committee were stenographically reported but have been printed in confidence for the use of Chairman Dent and his colleagues, and will not even be distributed to other members of the House. It is understood that the policy of secrecy to be pursued is due to the fact that much expert testimony was adduced at the hearings, covering not only types of planes, methods of construction, capacity of factories in this and foreign countries for the building of planes, but also certain important innovations in the arming and equipping of fighting airships.

It is asserted that, notwithstanding the greater experience of French and English aviators as compared with the members of the Flying Corps of the American Army, the airships to be built under the appropriation just reported will constitute an important advance over any heretofore constructed and will prove of great value in winning the war. Several types of airplanes will be built for the American Army in addition to the designs heretofore adopted of American origin. It is understood that the French, English and Italian Governments have placed at the disposal of the United States the best designs they are now employing in active service and that foreign factories will take several contracts to build airships for the American forces. It is also said that a part of the appropriation to be granted by Congress will be used in constructing hydro-airplanes that will be utilized in checking submarine warfare. This phase of aviation has been closely studied by both military and naval experts, and some extraordinary developments in this direction are promised in the near future.

The bill as it was passed by the House provides that the President may raise and maintain by voluntary enlistment or by draft "such number of enlisted men for the aviation service as are authorized by the measure." A very considerable part of the large appropriation will be used in the establishment of aviation schools and camps and a very large number of air pilots will be developed into experts in the shortest possible time.

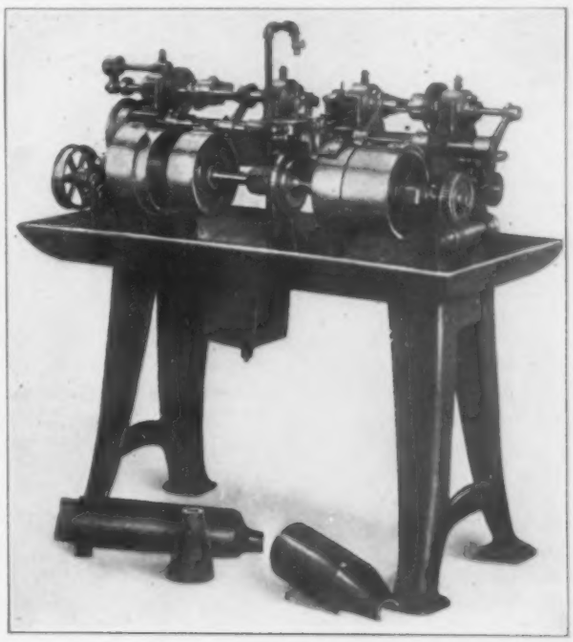
British Forgings, Ltd., Begins Operations

Rapid progress has been made in the construction of the steel plant being erected for the British Forgings, Ltd., on a site of 130 acres on Ashbridges Bay, Toronto. Construction work is being carried on under the supervision of the Toronto Harbor Commission's staff. Work was started the first week in February, and has been so energetically pushed that one of the furnaces has been completed and was put in operation June 18. There will be 10 electric furnaces in all and the total capacity of the plant will be from 300 to 400 tons of steel per day.

Automatic Machine for ⅜-In. Pins

A fully automatic machine of somewhat unusual design has been brought out by the Detroit Tool Co., Detroit. It is intended for producing small pieces that do not have to be drilled or threaded and do not exceed 3 in. in length from steel or brass stock up to ⅜ in. in diameter. The machine is intended for cutting off and turning only and the parts made by it are finished on both ends, thus eliminating the auxiliary operation of burring. If desired, the machine can be fitted up to take care of pieces on which a rolled thread can be used.

The machine has two spindles and the stock is fed in through the headstock spindle in the customary way to a feed stop. The tailstock spindle, which is geared to the same driving shaft as the headstock spindle



Pins 3 In. Long Are Automatically Turned and Cut Off from ⅜-In. Stock and Finished on Both Ends, Thus Eliminating the Auxiliary Burring Operation

and consequently revolves at the same speed, grips the stock. It is emphasized that the work is held rigidly during the entire cutting-off operation and no burr is left on either end of the product. This gripping of the work by both spindles also eliminates chatter in the cutting-off and forming operations, with a resultant increased production, due to the fact that more pieces can be cut off for each grinding of the tools and the feed of the tools can also be increased. The spindle bearings are of phosphor bronze and made to fit a steel sleeve having a taper hole to compensate for wear. This construction, it is emphasized, enables each bearing to be taken out and refitted and replaced without disturbing the alignment of the spindles.

The cross slides work independently of each other, thus enabling both front and back tools to be used simultaneously. The cams controlling the operation of the various tools are mounted on a shaft at the rear of the machine. A clutch located at the front of the machine enables the camshaft to be put in motion at any time. Placing the camshaft at the rear, it is pointed out, enables the cams to be changed easily. Change gears to the number of 14 are supplied with each machine, thus enabling the timing of the cams to be arranged so as to reduce the lost motion as much as possible.

The American Sheet & Tin Plate Co., New Castle, Pa., has commenced the operation of the first of its new double hot mills for the production of tin, effective July 3. The company is making rapid progress in the construction of additional mills to comprise a total of 10 new units for the manufacture of tin and terne plate.

Will Probably Not Build Armor Plate Plant

Many Difficulties in the Way of Government Construction—Cost Would Greatly Exceed the Appropriation—Time Is Also an Important Factor

WASHINGTON, July 17.—Every indication now points to the covering into the Treasury of the $11,000,000 appropriated by Congress last winter for the construction of the Government armor factory. The magnitude of the job, the great technical difficulties of such an undertaking, the impracticability of successfully operating an armor factory independently of a well co-ordinated steel works, the great increase in the cost of every factor entering into the enterprise, from the foundations of the building to the last item of equipment, and the impossibility of assembling within a reasonable length of time an adequately skilled personnel are some of the considerations that have finally brought the authorities to recognize the reasonableness of the proposition which the armor plate manufacturers made many months ago, viz., to permit the privately owned plants to continue to make high-grade armor for the Government at prices to be fixed by the Federal Trade Commission.

Many unforeseen things have happened since this proposition was rejected, but it is more than an impressive coincidence that the Government and the entire country are to-day waiting on the Federal Trade Commission to determine the cost of making steel as a basis for the prices which the President intends to fix, not only for the United States and its allies in the European war, but also for the private consumer. How far the plans of the Chief Executive with reference to price fixing may be carried through cannot be foreshadowed, but it is a moral certainty that, with the cooperation of the steel trade, they will be executed to a point that will eliminate all necessity for a Government armor factory.

Results of Investigation

The proposition to construct a Government plant for the manufacture of armor has not been abandoned without a careful investigation of its practicability and probable cost. The work of inquiry has been in able hands, and this fact renders the outcome the more significant. No difficulty was experienced in securing a desirable site; indeed, in this regard, an embarrassment of riches confronted the Secretary of the Navy, who was invited to take, on his own terms, any one of at least a score of more or less eligible locations. When, however, the work of estimating closely the cost of constructing and equipping a plant began, it immediately became evident that the appropriation at hand was wholly inadequate. The buildings alone would probably have cost much more than the entire amount allotted by Congress, while the cost of every item of equipment would have exceeded by from 50 to 200 per cent the estimates upon which the congressional committees based their calculations.

The time factor in this big equation had an important effect in discouraging the idea of a Government factory. While it was obvious at the outset that the projected plant could not be completed in time to supply any armor for the ships included in the Navy Department's three-year program of expansion, nevertheless Admiral Strauss, Chief of the Bureau of Ordnance at the time the Government armor factory measure was under consideration in Congress, expressed the opinion that the plant could be constructed and equipped and made ready for turning out armor in about half the time predicted by the most experienced steel men connected with private armor making establishments. Developments since these estimates were made have merely served to demonstrate the conservatism of the private manufacturers. Time is now the essence of every contract and builders and manufacturers alike, realizing the difficulty of obtaining materials and labor, are protecting themselves at all points and are unwilling to risk penalties for delays. While some extraordinary accomplishments in the way of quick building are currently reported, they do not include such complicated propositions as completely equipped Government armor factories.

Much More Money Required

Bids recently received by the Navy Department for the equipment of the projectile factory, which is to be built on the site acquired for the Government armor plant, indicate that the appropriation for fitting up the armor factory would have paid but for a small part of the necessary tools and fixtures. The allotment for tools for the projectile factory was proportionately larger than for the armor plant; nevertheless, the aggregation of the lowest bids on the equipment already advertised demonstrates that there will be a big deficit even assuming that the Government is able to secure reductions on some of the most important items, and it is now practically certain that the Ordnance Bureau will have to choose between deferring the installation of an important part of the equipment and asking Congress for more money.

A serious difficulty in the way of obtaining tools and equipment for the armor plant is the fact that much of the machinery is so heavy than only two or three manufacturers in the country are in position to build it, and the books of these concerns are so filled with rush orders, in many of which the Government itself is interested, that it would be impracticable, if not impossible, to meet the requirements of the armor factory within two or three years. The forging and bending shop, for example, will have three 14,000-ton presses capable of forging and bending the thickest and heaviest armor. The original estimate of their cost was $400,000 each, but a fair price to-day would probably be double this amount. A complication here is the fact that in the three private armor factories the forging and bending presses are of the hydraulic type, the use of which necessitates a very high power pumping engine. Certain experts have urged the installation of the steam intensifier type of forging press, which has been used abroad with considerable success and which is much cheaper than the hydraulic press. The efficiency of the steam intensifier has not been fully demonstrated in this country, however, and the designers of the Government plant must thus choose between a more or less experimental type of forging press and a more costly hydraulic type with its high-duty pumping engine.

No Request for Appropriation

No immediate announcement is likely to be made regarding the armor factory, although conclusions probably will be drawn from the significant fact that the Appropriations Committee of Congress has called upon the Departments for their final estimates for the special session and no request for an additional appropriation for the armor factory has been made. In the mean-

time, the Federal Trade Commission is prosecuting its investigation into the cost of making steel and promises a report to the President by Aug. 1 or very soon thereafter.

The commissioner's report will not attempt to fix prices and will doubtless serve merely as a starting point in negotiations between the President and the steel makers. It is quite possible that the steel producers will take exceptions to the findings of the commission, which will doubtless be amended, if errors can be pointed out. At the outset, the prices to be agreed upon will cover only those forms of iron and steel in greatest demand, especially plates and shapes for the construction of the emergency fleet under the supervision of the United States Shipping Board. Ultimately, however, it will be practicable, on base prices to be jointly determined by the Government and the trade, to fix the cost of any special product of steel and no trouble is anticipated in figuring a fair price for armor plate. The private armor manufacturers have already assured the Government in writing that their profits on armor have been less than a reasonable rate of interest on the money invested in special plant and equipment; hence, there is little prospect of any difficulty in arriving at a satisfactory cost basis for future contracts.

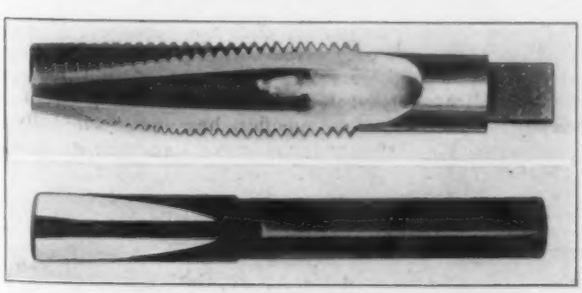
W. L. C.

Taps and Reamers of Special Design

A new design of taps and reamers has been developed by Carl Schoenert & Sons, Inc., 631 South Twentieth Street, Newark, N. J. The special feature about these tools is a hole drilled through the center, and among the advantages claimed for this arrangement are a better chance for lubrication and the elimination of the crowding of the chips into the holes. In the case of a reamed hole, it is stated that not only is the hole a true cylinder, but the surface is smooth and has the appearance of being polished. The grinding of the cutting edges, it is emphasized, can also be accomplished easily without any special adjustments.

The reamers, which are made in various sizes with both straight and taper shanks, are said to be strengthened by the hole that also gives a chance for lubrication and for the chips to work out of the hole and not block up the flutes. The chips produced are said to be of the same shape and appearance as those made by a lathe tool and the hole is made to the size of the reamer. The reamer can be used either right or left, as the cutting edges are on both sides. In this way, if the right hand side is worn off the reamer can be used left-handed if necessary, although the cutting edge can be easily sharpened by holding the reamer against the wheel of a grinding machine and conforming the edge to the shape of the wheel.

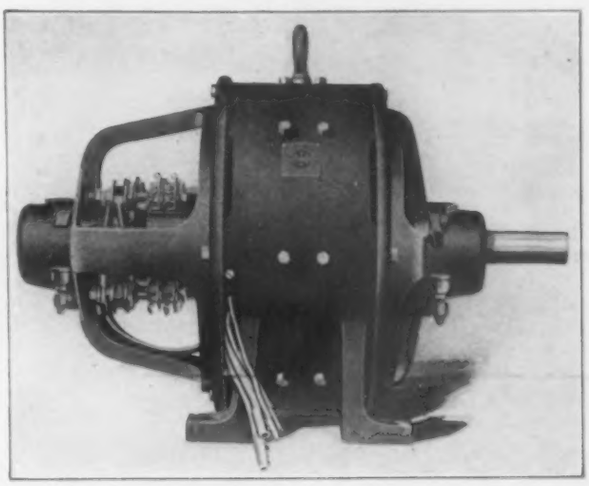
The taps are made on the same principle as the reamers, and it is emphasized that they have a greater clearance than the standard tap and cut the chips practically the same as a reamer would do. The hole drilled through the center of the tap gives the lubricant a chance to flow into the work.



Slotting the Blades of Taps and Reamers Is Claimed to Provide a Convenient Path of Exit for the Chips and Give an Opportunity for Lubricating the Cutting Edges

Direct Current Motor for Mill Service

A heavy duty, general service, direct current motor, designed to meet the requirements of iron and steel mills and metal working plants, has been brought out by the Reliance Electric & Engineering Co., Cleveland. This type T Reliance motor, as it is designated, is built for constant and adjustable speed duty. All frames have four laminated main poles, which are fastened in place by large cap screws. The field and commutating coils are assembled on pressboard and fiber spools. Metal supports between the coil and the frame clamp the fields in place.



Rigid Construction Characterizes a Direct Current Motor That Has Been Developed for Severe Service in Iron and Steel Mills and Metal Working Plants

The bearing housing has a deep oil well with a pocket in which sediment may settle without interfering with the operation of the oil ring. The bearings are cast-iron shells with a depression in which the babbitting is held in place. Pressure relief grooves, drained by a large hole, are provided at the end of the bearings to prevent oil being squirted along the shaft. The oil is distributed through spiral grooves. The bearing is shouldered in the end bracket against end thrust and held against rotation by dowel screws under the oil hole cover.

It is stated that a standard panel type, no-voltage release, starting rheostat is all that is required for non-reversing service not calling for frequent starting, but a drum type or automatic starter should be used if the motor is to be started or reversed frequently or under a load.

Prosperity at Youngstown

The payrolls of the leading independent plants in the Youngstown, Ohio, district for June amounted to $5,795,064, a new high record. The May payrolls were estimated at $5,402,315. The city of Youngstown has been enjoying for months the greatest prosperity in its history. Every manufacturing plant in the Youngstown district is running to full capacity, most of them night and day, when men can be obtained, and labor is being paid the highest wage ever known. The early completion of several of the new steel bar and small shape mills at the McDonald works of the Carnegie Steel Co., at McDonald, a few miles from Youngstown, will add still more to the general prosperity of Youngstown. Building operations in that city are extremely active, and there would be still more activity, were it not for the scarcity in the supply of skilled mechanics. Bank clearings in Youngstown are said to be nearly double what they were five years ago.

The Homestead Valve Mfg. Co., Pittsburgh, has appointed the National Mill Supply Co., Fort Wayne, Ind., its exclusive representative in the Fort Wayne vicinity.

The Role of Vanadium in Steel Making*

Its Value as an Alloy in Plain Carbon Forgings and Castings—Its Efficiency in Tool Steel—Effect on the Structure

BY G. L. NORRIS

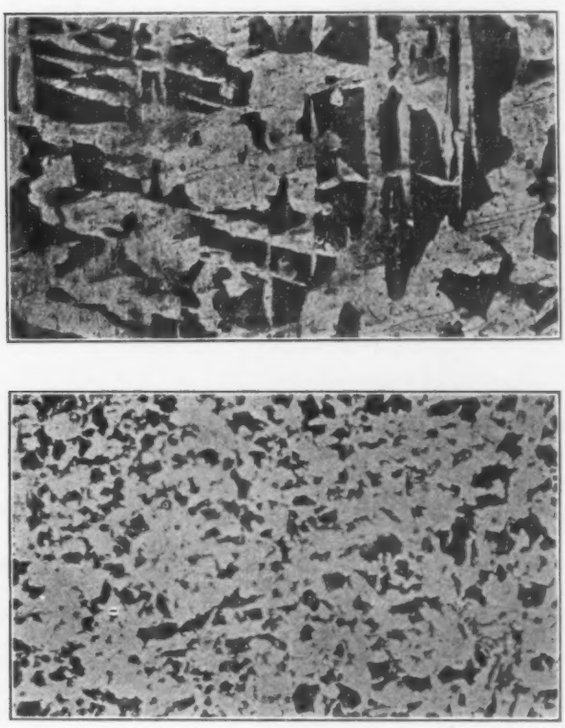
THIS discussion is confined almost entirely to the consideration of pearlitic-vanadium-ternary steel, or simple carbon-vanadium steel, and will not more than briefly touch on the quaternary-vanadium steels.

First, however, the writer wishes to touch briefly upon a still somewhat prevalent popular idea that vanadium is a powerful scavenger, and that the beneficial effects of its use in steel are principally due to its removal of minute, residual amounts of oxygen and nitrogen from the steel. It has even been advanced by some individuals that when all the vanadium added has been completely used up in scavenging, and none remains in the steel, all the improvement or beneficial effects possible have been accomplished; despite the fact that there is an increase in the mechanical properties of the steel with increasing amounts of vanadium present, and that vanadium has equally as great beneficial effects in steels made under reducing conditions such as crucible and electric furnace steels, as in the case of steels made under oxidizing conditions like open-hearth and Bessemer steels. While it is true that vanadium oxidizes readily and will combine with nitrogen, its value as a scavenger is negligible, as there are much cheaper metals that are as effective, or perhaps more so.

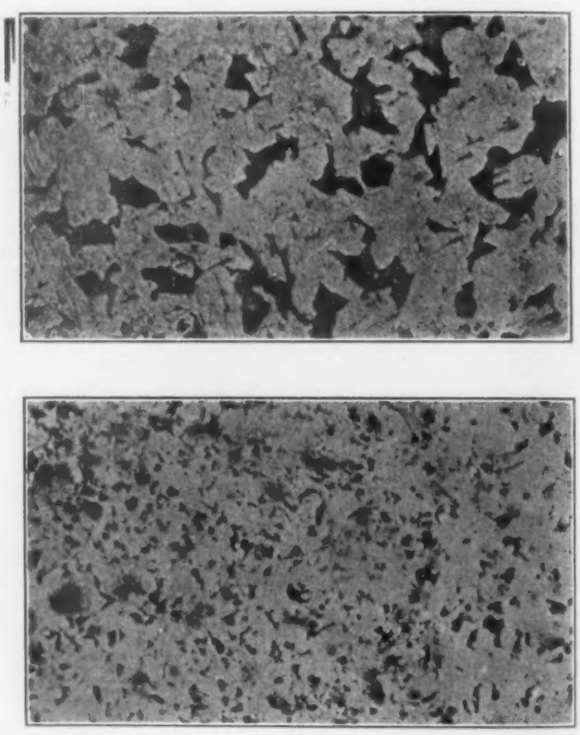
The remarkable effects of vanadium on steel are due entirely to its presence in the steel as an alloying element, and its influence on the other constituents with which it is in combination. When added to steel it is found in both the main constituents, ferrite and pearlite, but principally in the latter. Only a few hundredths of one per cent of the vanadium combines with the ferrite. This minute amount, however, appears to increase the strength, toughness, hardness and resistance to abrasion of the ferrite. Nearly all the vanadium, however, is found in the pearlite, in chemical combination with the cementite, as a compound carbide of vanadium and iron in the case of ternary steel, and as more complex carbides in the case of quaternary steels.

Vanadium replaces the iron in the cementite or the carbide by increasing amounts until finally, when the percentage of vanadium is about 5 per cent, all the iron has been replaced by the vanadium. The vanadium-containing cementite is not as mobile as ordinary cementite and consequently does not segregate into as large masses, but occurs in relatively minute particles and, therefore, is more uniformly distributed. It does not, consequently, readily occur as lamellar or thin plates in the pearlite, but in a granular or sorbitic condition. This strong tendency of vanadium to form sorbitic and even troostitic pearlite, is doubtless one of the reasons for the mechanical superiority of steels containing vanadium, not only statically but dynamically.

Vanadium carbide is not as readily soluble on heating as iron carbide, and consequently vanadium steel requires a higher temperature to dissolve the cementite and put the steel in the austenitic condition for quenching. The presence of vanadium does not raise the Ac_1 and Ar_1 points more than about 10 deg. C., and repeated heatings do not seem to lower the Ar_1 point. The Ac_{2-3} and Ar_{2-3} points are raised somewhat more and continue to rise with increase in percentage of vanadium.



Photomicrographs, 60 Diameters, of Open-Hearth Carbon Steel for Castings, Containing 0.27 Per Cent Carbon, 0.54 Per Cent Manganese and 0.29 Per Cent Silicon. The upper one represents the metal as cast and the lower as annealed at 860 deg. C.



Photomicrographs, 60 Diameters, of Open-Hearth Vanadium Steel for Castings, Containing 0.28 Per Cent Carbon, 0.58 Per Cent Manganese, 0.26 Per Cent Silicon and 0.16 Per Cent Vanadium. The upper one is the metal as cast and the lower as annealed at 860 deg. C.

*From a topical discussion on the role of various alloying elements in alloy steels, presented at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 27, 1917. The author is metallurgist, American Vanadium Co., Pittsburgh.

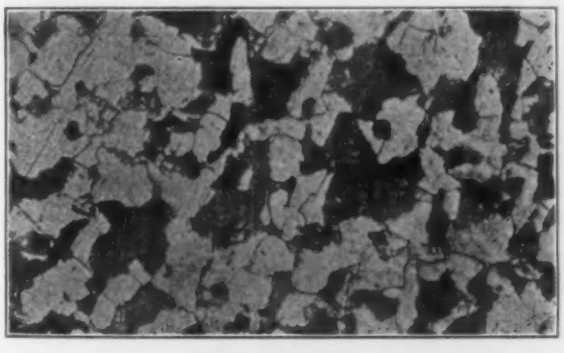
The effect of vanadium on the physical or mechanical properties of steel increases with the percentage of vanadium until about 1 per cent is present, after which there is a decrease, even in the case of quenched steels, and with 3 per cent or more of vanadium the steel is actually softened on quenching until unusually high temperatures are reached, say about 1300 to 1400 deg. C.

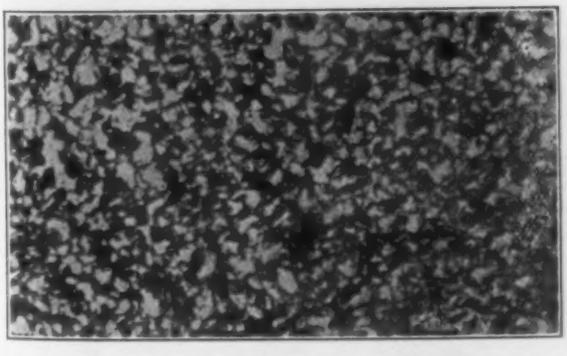
Vanadium in Tool Steels

Vanadium steel hardenite has a greater thermal stability, or power to withstand elevated temperatures without softening or breaking down or separation of cementite. This property is responsible for the great improvement in high-speed steels, through the addition of vanadium to stand up longer under the high temperatures developed at the point of the tool in taking heavy cuts at high speed. Percentages of vanadium as high as 3.50 have been successfully used in high-speed steel, and 1.50 to 2.50 per cent are not uncommon, although only a few years ago the percentage ranged from 0.30 to 0.75, and it was thought that the addition of over 1 per cent gave very little additional advantage. The improvement in high-speed steel through the use of vanadium has borne an almost direct relation to the percentage of vanadium present, and is considered to be from 60 to 100 per cent.

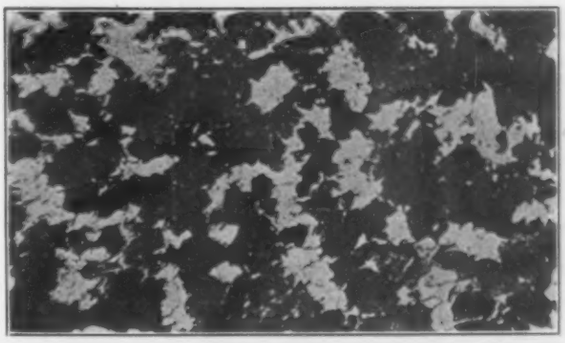
In the case of carbon-vanadium tool steel the use of vanadium has proved almost equally beneficial, although at present only about 0.2 per cent of vanadium is used in such steel. It has a wider quenching range—that is, can be heated higher without injury—hardens deeper, retains cutting edge longer, and is very much tougher and stronger. A bar of 1 per cent carbon tool steel containing 0.25 per cent vanadium, quenched and drawn back at 400 deg. C., will bend 90. deg. without failure, whereas a similar steel without vanadium will bend only about 20 or possibly 30 deg.

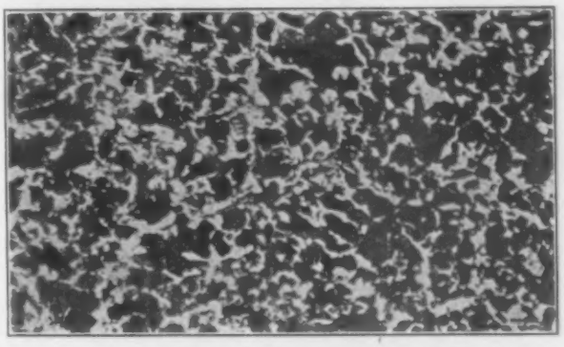
Comparative compression tests of such tool steels with like tempering or drawback gave on 1¼-in. cubes, 490,000 lb. for the vanadium steel and 278,000 lb. for the steel without vanadium. For battering tools, such as pneumatic chisels, setts, calking tools, rock drills, etc., vanadium tool steel possesses marked superiority on account of its combination of hardness, strength and toughness.





Photomicrographs, 250 and 270 Diameters Respectively, of Open-Hearth Bar Steel, the Upper Containing 0.45 Per Cent Carbon and 0.48 Per Cent Manganese and Annealed at 800 Deg. C., While the Lower Has 0.34 Per Cent Carbon, 0.87 Per Cent Manganese and 0.13 Per Cent Vanadium, and Annealed at 790 Deg. C.





Photomicrographs, 250 Diameters, of Open-Hearth Bar Steel, Annealed at 800 Deg. C. The upper represents steel containing 0.43 per cent carbon and 1.30 per cent manganese; the lower, steel containing 0.47 per cent carbon, 0.90 per cent manganese and 0.15 per cent vanadium

One of the principal applications of vanadium steel has been for steel castings, particularly for locomotive frames. The composition of the steel is the same as usual for such castings, excepting for 0.15 per cent or more vanadium. The addition of this small amount of vanadium increases the elastic limit of the annealed castings 25 to 30 per cent without lowering the ductility. The tensile strength is not increased proportionately in the case of thoroughly annealed castings, but is usually 10 to 15 per cent greater. The following averages of tests within the same ranges of composition, having about 0.25 per cent carbon, 0.62 per cent manganese, 0.27 per cent silicon, with about 0.18 per cent vanadium in the vanadium steel, are typical:

	Carbon Steel	Vanadium Steel
Elastic limit, lb. per sq. in.	36,495	48,210
Tensile strength, lb. per sq. in.	73,820	79,930
Elongation in 2 in., per cent.	27.3	26.6
Reduction of area, per cent.	46.0	48.1

For reasons apparent from what has been previously stated, vanadium-steel castings require a somewhat higher annealing temperature than ordinary steel castings. They are also more susceptible to hardening, and therefore should be cooled slowly in the annealing furnace until they have cooled below the Ar_1 point. The annealing temperature should be about 875 deg. C.

Special Treatment of Steel Castings

There is a growing tendency to heat treat, and quench and temper steel castings for many purposes. Vanadium steel is much more suitable for heat-treatment than ordinary steel, as it hardens more on quenching and consequently much higher physical properties can be obtained. Even air cooling from the annealing temperature, followed by an annealing at a low temperature, greatly increases the elastic limit without affecting the ductility. One company by this treatment meets the following minimum physical requirements with vanadium steel of the average chemical composition previously given:

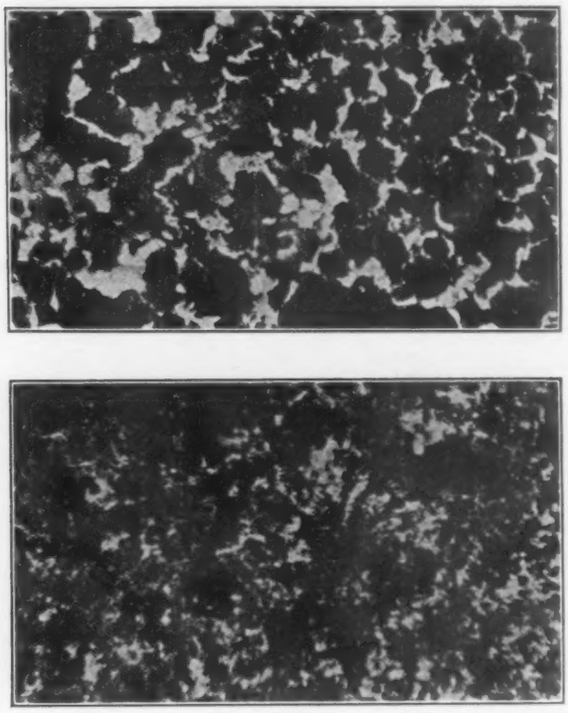
Elastic limit, lb. per sq. in.	65,000
Tensile strength, lb. per sq. in.	80,000
Elongation in 2 in., per cent.	20
Reduction of area, per cent.	40

Tests of quenched-and-tempered castings of the same composition show as follows, the quenching and draw-back temperatures being the same for both steels:

	Carbon Steel	Vanadium Steel
Elastic limit, lb. per sq. in.....	58,630	72,860
Tensile strength, lb. per sq. in....	90,630	95,630
Elongation in 2 in., per cent.....	25	26
Reduction of area, per cent.....	52	56

For higher carbons, the advantage in favor of vanadium steel is even greater. Water was the quenching medium.

There is also doubtless a great future for vanadium-quaternary-steel castings, both annealed and heat-treated—particularly the latter—for, as in the case of forged or rolled quaternary steels, the improvement in the mechanical properties from the presence of vanadium would be much greater even than in the case of simple carbon-vanadium steel.



Photomicrographs, 600 Diameters, of Crucible Bar Steel, Annealed at 800 Deg. C. The upper one represents steel containing 0.65 per cent carbon and the lower the same steel with 0.22 per cent vanadium

Plain Carbon-Vanadium Forgings

The value of vanadium in simple carbon forging steels has been over-shadowed by the greater mechanical properties of the vanadium-quaternary steels, such as chrome-vanadium, yet they have mechanical properties equal to those of ordinary 3 per cent nickel steel under like conditions. Excepting where the very high physical properties obtainable from quaternary steels are desired, carbon-vanadium steel can be used to advantage, especially for large forgings.

This steel presents fewer manufacturing difficulties than quaternary steels. It is less liable to losses from shrinkage cracks and checks in the ingot, and to heating and cooling strains in the forging and heat-treatment operations. It requires no more special care in handling than ordinary carbon steel, and is worked with equal facility.

Carbon-vanadium forging steel in the normalized condition, which may be described as annealed for grain refinement, has physical properties superior to those specified for heat-treated carbon-steel forgings. This simple treatment alone, therefore, gives physical properties sufficiently high for a great number of forgings that would otherwise have to be quenched and tempered.

A large field for annealed or normalized carbon-vanadium steel is its use for locomotive forgings. It is generally conceded that there is need of a steel of greater strength, not only to meet present conditions, but also to permit of reducing sections of reciprocating parts to obtain better counterbalancing. To meet this requirement, the railroads several years ago turned to heat-treated carbon and heat-treated alloy steels, notably chrome-vanadium.

The use of heat-treated locomotive forgings has not proved altogether satisfactory for a number of reasons. One objection to the use of these forgings is the lack of heat-treating equipment in most railroad shops. This operates particularly in repair work where for any reason the forging has to be locally heated to straighten, stretch or shorten, destroying thereby the effect of the original heat treatment and producing inequalities which may result in failure. Probably no other class of forgings is subject to as abusive use as locomotive forgings, and under such conditions ordinary heat-treated forgings have not been found reliable. For these and other reasons annealed forgings are preferred. Consequently, a steel that could give in an annealed condition physical properties equal to or even better than those specified for heat-treated carbon-steel forgings, would prove very desirable.

Carbon-vanadium forging steel responds to heat treatment in a very superior manner, and in this condition will meet the requirements specified by the society for quenched-and-tempered nickel-steel forgings.

The table shows the physical properties of carbon-vanadium forging steel under various conditions of section and treatment. The photomicrographs illustrate the marked influence of vanadium on the micro-

Table of Physical Properties of Carbon-Vanadium Forging Steel

Chemical Composition, per Cent	Kind of Specimen	Treatment	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation in 2 In., per Cent	Reduction of Area, per Cent
C. 0.34 Mn. 0.87 V. 0.13	1¼-in. round bar	As rolled	78,000	102,000	23	51
		Annealed 800° C	65,000	86,000	28	63
		Oil Q. and T., 900/600° C.	90,000	118,000	25	61
		Oil Q. and T., 875/600° C.	85,000	102,500	22	57
		Water Q. and T., 875/600° C.	93,000	110,000	24	57
		Water Q. and T., 845/565° C.	109,000	125,000	19	60
		Water Q. and T., 845/540° C.	112,500	130,000	19	58
		Water Q. and T., 845/510° C.	115,000	133,350	19	58
		Water Q. and T., 845/455° C.	118,500	145,000	15	51
		Water Q. and T., 845/400° C.	132,500	160,000	12	40
C. 0.37 Mn. 0.96 V. 0.13	1-in. round bar	As rolled	75,000	102,000	23	57
		Annealed 800° C. in air	70,000	90,000	28	63
		Oil Q. and T., 900/650° C.	90,000	114,000	22	64
		Oil and Q. T., 900/600° C.	92,000	118,500	21	63
		Oil Q. and T., 900/540° C.	95,000	120,500	22	62
		Water Q. and T., 830/650° C.	85,000	102,000	26	68
		Water Q. and T., 830/600° C.	97,000	115,000	23	65
		Water Q. and T., 830/540° C.	100,000	120,000	23	67
C. 0.37	3½-in. hub, outside[1]	Oil Q. and T., 900/595° C.	92,000	119,000	20	55
Mn. 0.96	3½-in. hub, center[1]	Oil Q. and T., 900/595° C.	87,000	116,000	20	52
V. 0.13	2½-in. pin, center[1]	Oil Q. and T., 900/595° C.	95,000	121,000	18	52
C. 0.47 Mn. 0.90 V. 0.15	1½-in. round bar	As rolled	98,000	135,000	16	39
		Annealed 790° C.	70,000	108,000	21	51
		Annealed 790° C.	70,000	107,000	22	53
		Annealed 830° C.	75,000	107,500	21	48
		Oil Q. and T., 900/700° C.	95,000	120,000	22	61
		Oil Q. and T., 900/650° C.	97,000	125,000	21	60
		Oil Q. and T., 900/600° C.	100,000	128,000	21	58
		Oil Q. and T., 875/430° C.	117,000	137,000	19	52
		Oil Q. and T., 875/315° C.	112,000	139,000	18	51
		Oil Q. and T., 875/200° C.	115,000	142,500	17	45
		Water Q. and T., 830/595° C.	122,000	136,000	20	57
		Water Q. and T., 830/540° C.	130,000	144,000	19	55
		Water Q. and T., 830/430° C.	150,000	172,000	15	44
		Water Q. and T., 830/315° C.	140,000	171,000	11	30
C. 0.47 Mn. 0.90 V. 0.15	7-in. axle	As forged	68,000	123,000	16	30
		Annealed 790° C.	52,000	90,000	24	50
		Oil Q. and T., 870/625° C.	82,000	112,500	22	55
C. 0.47 Mn. 0.90 V. 0.15	11-in. axle	As forged	70,000	117,000	16	28
		Annealed 790° C.	54,000	94,000	22	47
		Oil Q. and T., 870/625° C.	80,000	115,000	20	52
C. 0.47 Mn. 0.90 V. 0.15	Connecting rod	As forged	85,000	131,000	17	44
		Annealed 790° C.	67,000	105,000	23	52
		Oil Q. and T., 870/625° C.	86,000	123,000	20	50
C. 0.47 Mn. 0.90 V. 0.15	11-in. axle, bored with 5-in. hole	Annealed 880° C. in air	63,000	97,000	24	52
		Annealed 880° C. in air	64,000	99,500	23	51
		Annealed 880° C. in air	65,000	100,000	23	52

[1]Specimen from aeroplane engine crank shaft forged from 4 by 4-in. billet cut from 4 by 16-in. slab.

structure of simple carbon steel. [It will be noticed that it tends to close the structure as compared with the same steel without the vanadium. This is noticeable in each case.—ED.]

As previously stated, the influence of vanadium on the mechanical properties of quaternary steels is even greater than on simple or carbon steel. The best known and most extensively used of these is chrome-vanadium steel. Nickel-vanadium steel, while having possibly even higher tensile properties than chrome-vanadium steel, is considerably more expensive and has not been found to meet all conditions as satisfactorily as chrome-vanadium steel. It does not appear to have as high a resistance to shocks and repeated stresses.

Nickel-chrome-vanadium steel has found extensive application in light armor such as deck plate, gun shields and armor-piercing projectiles, where its use has greatly improved the efficiency of these materials.

Discussion

E. O'C. Acker, metallurgist, Bethlehem Steel Co., South Bethlehem, Pa., took issue with a statement of Mr. Norris, that nickel-chrome-vanadium steel has found extensive application in light armor, such as deck plate, gun shields and armor-piercing projectiles. He said that the best armor piercing projectiles are chrome-nickel and contained no vanadium. Similarly he said that the so-called special treatment steel was made without vanadium.

Mr. Norris replied that Mr. Acker's remarks involved certain commercial considerations which he did not wish to go into at the time. He maintained that vanadium was used by England, Italy and France in special treatment steel, and he knew of English helmets of nickel-chrome-vanadium steel.

Sulphate of Ammonia Output in 1916

Sulphate of ammonia production in the United States in 1916 is estimated to have been 325,000 tons, an increase of 75,000 tons or 30 per cent over that of 1915, according to pamphlet No. 83, published by The Barrett Co., 17 Battery Place, New York. Of the 1916 total, 272,000 tons are credited to the coke ovens and 53,000 tons to the gas works and bone carbonizing plants. The corresponding figures for 1915 were 197,128 tons for the former and 51,921 tons for the latter, according to the U. S. Geological Survey. To this 1915 total of 249,049 net tons should be added 1000 tons estimated for the recovery of sulphate of ammonia from bone carbonization. The 1916 increase of 75,000 tons is termed notable, but it is scarcely larger than that of Germany in 1912, when that country's coke-making industry was being transformed from a non-recovery to a recovery basis.

The 1916 coke output was a record for both beehive and by-product ovens, amounting to over 54,000,000 tons. This corresponds to about 82,300,000 tons of coal which taken with the gas works carbonization of some 4,700,000 tons brings the total coal carbonized to 87,000,000 tons for the year. This should have yielded 870,000 tons of sulphate of ammonia if treated in by-product ovens instead of 325,000 tons, the estimated recovery. Only 37 per cent of the possible recovery is being achieved.

Leases Ore Land

The Matthews Iron & Mining Co., Rome, Ga., has leased a 640-acre tract of brown ore land at Cartersville, Ga., in order to assure a full supply of brown ore to be used as a mixture with its Taylor Ridge red ore in the furnace of the company at Rome, Ga. The two leases covering red and brown ores assure the company a permanent supply and it will have a surplus for sale. The company, which some time ago purchased the 100-ton stack at Rome formerly operated by the R. G. Peters Mining Co. and the Silver Creek Furnace Co., has sold the entire output for the last half of 1917 and has also sold a considerable tonnage for the first quarter of 1918. The furnace was blown in a few days ago.

WISCONSIN ORDNANCE PLANT

Company Is Organized by Leading Manufacturers at Milwaukee

The Wisconsin Gun Co., Milwaukee, has been incorporated with a capital stock of $100,000 to erect and equip a plant for the manufacture of 3-in. field pieces of the 1916 model for the United States Government. The company is organized at the request of the Government by five important metalworking industries of Milwaukee, namely, Kearney & Trecker Co., milling machines; Cutler-Hammer Mfg. Co., electric controlling devices; Northwestern Malleable Iron Co., founder; Bucyrus Co., South Milwaukee, steam shovels, and Power & Mining Machinery Co., Cudahy, unit of the Worthington Pump & Machinery Corporation. The officers will be: President, W. W. Coleman, Bucyrus Co.; vice-presidents, E. J. Kearney, Kearney & Trecker Co.; John D. Bird, Power & Mining Machinery Co.; secretary, Frederick L. Sivyer, Northwestern Malleable Iron Co.; treasurer, Frank R. Bacon, Cutler-Hammer Mfg. Co. The directors include the officers and E. D. Swigart, Bucyrus Co.; Theodore Trecker, Kearney & Trecker Co.; A. W. Berresford, Cutler-Hammer Mfg. Co.; W. C. McMahon, Northwestern Malleable Iron Co.; C. P. Coleman, Power & Mining Machinery Co.

The company will immediately erect and equip a shop with 40,000 sq. ft. of floor space and employing 400 skilled workmen. The Cutler-Hammer Mfg. Co. has given the service of its superintendent, Henry J. Wiegand, to supervise the erection, equipment and management of the plant. It is calculated to produce 1000 guns at the rate of three each working day. The main forgings will be supplied in rough finish by the Government and the carriages and other parts will be made elsewhere, so that the Milwaukee shop will do the machining and assembling of the ordnance and make it ready for mounting upon slides fitted on carriages. The completed gun will be about 7½ ft. long and weigh 1100 lb.

The Government has made an informal statement that the capacity of the plant will be required and that when it is possible to do so, it will enter into a contract for the entire output. In the meantime, the Government hopes that the five manufacturers of Milwaukee will proceed with the erection and equipment of the shop. No mention of profit has been made in any detail of the project and the enterprise has been undertaken from a sense of duty and a desire for service to the nation, it is stated.

Only five guns of the model to be made in Milwaukee have thus far been manufactured, this work having been done at the Watervliet Arsenal. The gun is absolutely standardized in every particular for interchangeability of every part in assembling, reassembling or in case of replacements.

Rapidly Building Cantonments

WASHINGTON, July 17.—Recent reports received from the constructing quartermasters in charge of the 16 cantonments are to the effect that rapid progress is being made and, while it is improbable that all of the camps will be completed by September 1, as is desired, it is likely that all will be in readiness by the time the drafts are completed and the men chosen thereunder are assembled. War Department officials deny with emphasis the numerous charges which recently have appeared in the daily press that contractors for the cantonments now being erected for the housing of the new National army are either perpetrating frauds upon the Government or are demoralizing industrial conditions by paying exorbitant prices for material and wages far in excess of those current in the vicinity of the projected camps.

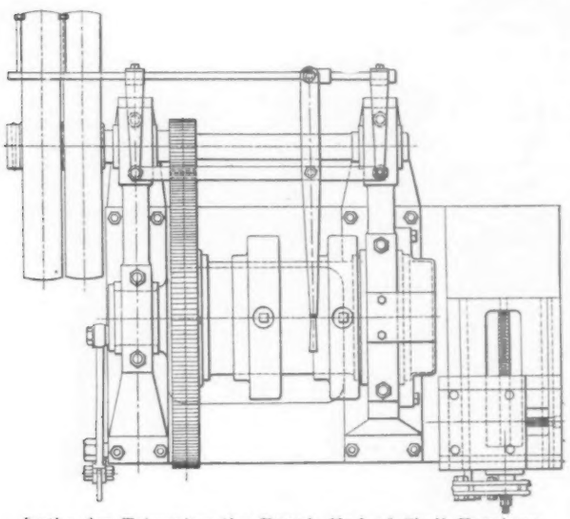
The Madison, Ill., plant of the Helmbacher Forge & Rolling Mill Co., which has been closed down some time for repairs, reopened July 16 with a force of 600 men. The company has completely overhauled the plant during the shutdown.

MUNITION-MAKING MACHINES

Special Vickers Lathes and the Appliances Used in Connection with Them

GREAT ingenuity has been exercised in the development of special munition machines and crane equipment by different British builders of machine tools. The objects kept in mind were the utilization of the same type of machine for a variety of operations and rendering women and other partially skilled and unskilled workers available and efficient. A number of these machines, which were built by Vickers, Ltd., were recently illustrated in *Engineering*. A line of machines has been developed for trimming off the rough end, boring and facing the nose and threading the base of the interior for the adaptor of large shells. While the operations performed are widely different, the main constructional features of the machines are identical. Among the advantages of such an arrangement are a lessened cost and a saving in the amount of floor space occupied due to the compact design. While a standard engine lathe with special chucking equipment could handle all three operations, it is a much more complicated machine and occupies considerably more floor space, while the cost is from two to five times as great.

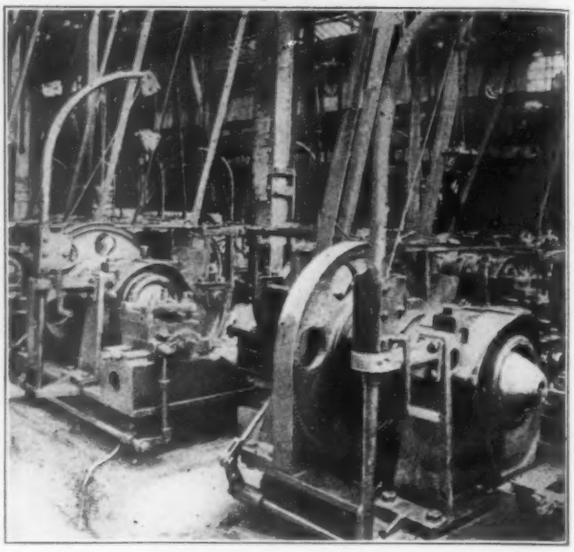
The lathe in its simplest form consists of a box bed and two cast-iron side frames which carry the bearings



Lathe for Trimming the Rough End of Shell Forgings

for the main and pulley spindles. The former is hollow and of large diameter and is driven by a single reduction gear from the pulley spindle, which is fitted with both tight and loose pulleys, thus eliminating the countershaft. The hollow spindle has a sufficient internal diameter to take the forging, and is of such a length that when the shell is nested in it the projecting end is in a convenient position for machining. The belt shifter is operated by a hand lever mounted on the machine frame.

The first operation, that of trimming off the rough end of the shell forging preparatory to turning the outside and boring the interior, is accomplished by a parting tool carried in the tool rest. The rest is carried on a block which is bolted directly to the bed and has both cross and longitudinal feeds. The former, of course, is the one employed in the trimming operation and is of the ratchet type, the pawl being driven from a reciprocating shaft carried on the front of the bed and operated from a crankpin on the outer end of the main spindle. In general, however, the girls operating the lathes prefer to use hand feed, this method entailing no change in the machine. This lathe without any modifications is also employed for facing the base of the shell, the only difference being that greater accuracy in setting up is required, since the shell is turned and bored prior to this operation. To facilitate setting up, a ring, the inner surface of which is shaped to conform to the shell nose, is fixed at the rear end

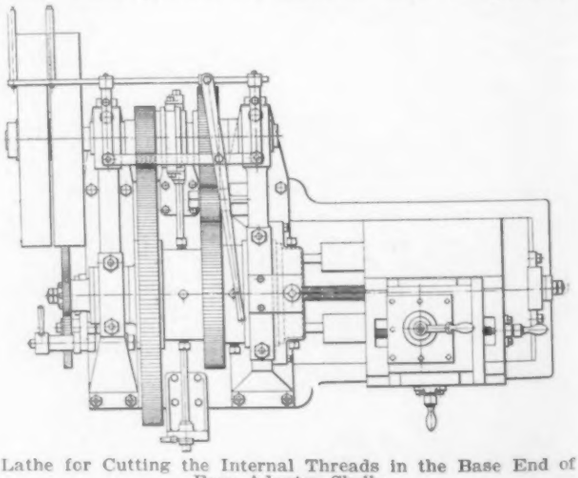


The Nose End of Large Shells Is Faced and Bored in This Special Lathe

of the hollow spindle. The nose of the shell fits into this ring and thus automatically centers the base. In the case of a machine used for trimming the smaller shells, the ratchet feed gear is omitted.

The principal modification to adapt the lathe for facing and boring the nose is the use of power to operate the longitudinal feed instead of the cross feed. This change is due to the fact that the boring is the major portion of this operation, the facing being a comparatively small job which can be easily performed with hand feed.

The general construction of the machine employed for internally threading the base end of base adaptor shells is the same as the other two lathes, although the construction is slightly more complicated. Instead of bolting the tool rest to the base, it is arranged to travel and is operated by a lead screw driven by a train of gears in the customary way. Two pinions of different sizes are mounted on the pulley spindle. One of these drives the main spindle through an idler gear while the other drives it direct, the engagement of these pinions being controlled by a dog clutch. In this way the direction of rotation of the main spindle is reversed. A solid nut which is always in engagement with the lead screw is employed to traverse the slide rest. This arrangement eliminates all likelihood of the rest getting out of pitch with the thread that is being cut, a thing that might be possible were a split nut used, as the lathes are operated entirely by unskilled labor. To stop the travel of the tool rest, a lever at the front of the machine at the left end is provided to throw the gears driving the lead screw out of mesh. A square turret and four tools are provided to recess the rear end of the thread, counterbore, cut and chase the thread. The different sized pinions on the pulley shaft provide for different rates of speed in

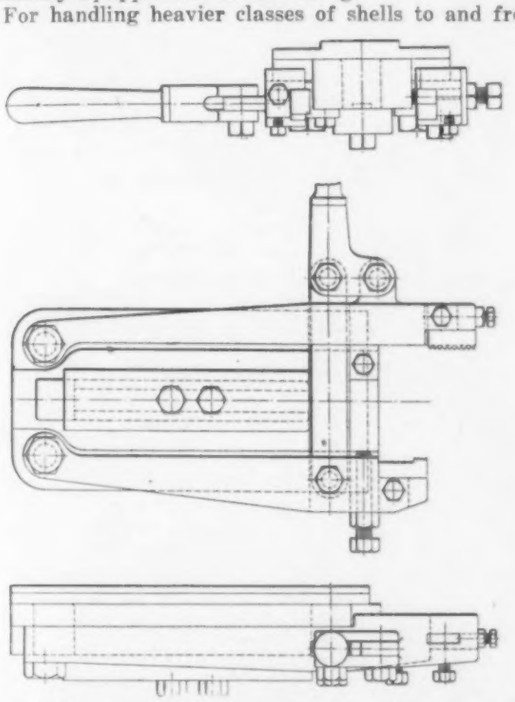


Lathe for Cutting the Internal Threads in the Base End of Base Adaptor Shells

posite directions, the rapid one being used for bringg the tools into place, while all the cutting is done the slower speed.

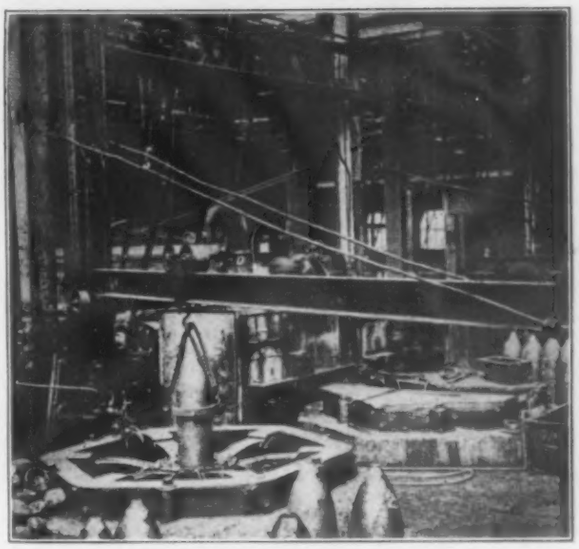
An ingenious self-contained attachment is employed r cutting the thread in the base of shells having readed base plates. It is held in the tool rest and nsists of a pair of levers which can be moved toward r away from each other by a toggle and a handle. ne lever carries a half nut which engages with a read cut on the outside of the nose of the main the spindle, while the other carries a chaser that uts the thread in the shell base, the whole attachment being arranged to slide on a block attached to the tool rest. In operation the device is placed in position with the levers embracing the shell end. The toggle is then closed so that the half nut engages with the thread on the spindle, and at the same time the chaser makes contact with the interior of the base plate recess. The thread is cut as the attachment travels along due to the rotation of the lathe spindle and the engagement between the half nut and the thread on the spindle nose, the depth of thread being regulated by an adjusting screw. In this way it is possible to thread the base end of shells on a lathe that is not ordinarily equipped for screw cutting.

For handling heavier classes of shells to and from



The Self-Contained Attachment Which Is Used for Cutting Internal Threads and Is Held in the Ordinary Tool Rest

a copper banding press, a crane consisting of a simple radial jib made from a joist has been developed. The inner end of the jib is carried by the ram of a vertical hydraulic cylinder and guides and tension rods serve to guide and support the jib. A single valve, which controls the admission of pressure to the cylinder, regulates the movement of the jib, a diaphragm fitted in the exhaust being relied upon to prevent a too rapid descent. The trolley on the jib is not geared and is simply pulled along by hand, the slewing also being accomplished in this way by pulling on the hanging shell or the fall. Another lifting arrangement is of the davit type, which is attached to one of the side frames of the lathe. It has been developed to reduce the work required from overhead cranes and to render the lathe largely independent of them. A lifting drum with a ratchet and pawl arrangement is provided and the use of this crane enables a girl to lift a rough 9.2-in. forging into place for trimming. One of these cranes is shown in connection with the illustration of the lathe for facing and boring the nose ends. Another crane has a swinging jib and ratchet lifting drum and is set to serve two lathes as a general thing, swinging over one to feed the other. There is no trolley on the jib, the crane being set so that the shell swings exactly into the lathe centers or chuck as required, the



At the Copper Banding Press a Simple Form of Radial Jib Crane Is Employed to Lift the Heavier Shells

lathes, of course, being placed so that the load comes where required for each of them. The post is usually set a little out of the vertical so that the jib will swing inward when not in use and not be left projecting out into the bay where it might catch passing loads carried by the overhead traveling cranes.

New Car Service Division

WASHINGTON, July 17.—A Division of Car Service has been created by the Interstate Commerce Commission under the authority conferred by the car service act approved May 29, 1917, amending Section 1 of the act to regulate commerce, to deal with the movement, distribution, exchange, interchange, and return of freight cars. E. H. DeGroot, Jr., until recently superintendent of transportation of the Chicago & Eastern Illinois Railroad Co., now in the exclusive employ of the Interstate Commerce Commission, has been appointed chief of the division, and with A. G. Gutheim, attorney-examiner of the Interstate Commerce Commission, will take immediate charge of its organization and operation. The commission has also secured temporarily for this work the services of H. C. Barlow, chairman of the Executive Committee of the National Industrial Traffic League. During its formative period, the division will have the collaboration and advice of Mr. Barlow.

The Interstate Commerce Commission through this division will regulate car service throughout the United States, and, where occasion requires, orders or directions of the Interstate Commerce Commission will issue under the car service act direct to the carrier or carriers concerned. Subject to this fundamental principle, the Division of Car Service will, as far as practicable, avail itself of co-operative effort on the part of the carriers' Commission on Car Service, now located in Washington. This latter body consists of seven members, all superintendents of transportation of different railroads which territorially cover practically the entire United States. The Commission on Car Service has a large force of assistants under its control in Washington and in the field.

Complaints and communications regarding car service received by the Interstate Commerce Commission will be handled through the new division.

About 100 manufacturers and dealers in motor trucks in the Cincinnati district recently attended a lecture on truck springs and axles given at the United States Motor Truck Co.'s plant in that city by J. R. Phillips, service manager of the Sheldon Spring & Axle Co., Wilkes-Barre, Pa. The design and construction of worm drive truck axles and of methods of taking care of them after they have been put into service, were explained. Luncheon was served by the company to its guests. Similar lectures will be given in future.

Mechanics of the Chilled Iron Wheel*

Determining Factors Limiting Wheel Loads — Margin for Future Increases—Number Now in Service

THE mechanics of the chilled wheel have never been investigated except in a superficial way. The fundamental properties of chilled iron such as specific gravity, modulus of elasticity for varying tensile strengths, action under repeated stresses, relation of operating conditions to temperature stresses, etc., are not established. Dollars are spent in the investigation of steel where cents are devoted to chilled iron. In the face of this neglect the chilled iron wheel by sheer merit survives the struggle for existence. If the properties of chilled iron were fully understood and properly used in the wheel, a large return on the meager expenditure for investigation would flow in upon the manufacturers in the way of increased profits and to the railroads in the way of reduced costs.

Chilled Wheels Now in Service

Its economic importance can be realized when it is borne in mind that there are 25,000.000 such wheels in service, representing 8,000,000 tons of metal, requiring an annual production of 3,000,000 wheels or approximately 1,000,000 tons of chilled iron to replace those worn out in service.

The economic phase of the subject is fully established. A few suggestions are here offered that will ultimately lead to a more intelligent design and classification of wheels for the service they are to perform. Since 1875 wheel loads have increased 500 per cent, axle weights 230 per cent and wheel weights 75 per cent.

The 11,000-lb. wheel load under the 30-ton car was supposed, at the time of its introduction, to be the maximum that could be carried without breaking down the surface metal of the wheel tread and the top rail. This opinion, however, did not long impede the growth in wheel loads, for soon the 50-ton car was introduced with 20,000 lb. concentrated on one wheel. It was considered that this was the limit in car capacity and that the chilled iron wheel might not be fully satisfactory under this burden. Again this opinion is exploded, not only by the successful performance under a half million 50-ton cars, but by the fact that the chilled iron wheel has passed the experimental stage under the 70-ton car with a wheel load of 25,000 lb.

The latest increase is the experimental 35-ton car and 12,000-gallon capacity engine tender requiring an axle having a 6½ x 12-in. journal and 8⅛-in. wheel fit—designed to carry 60,000 or 30,000 lb. per wheel. It is a matter of interest to note that in the year of 1890, 30 tons was considered the maximum car capacity. We now have a single axle of 30 tons capacity or 30,000 lb. per wheel, which shows the marvelous increase in wheel burden.

Chilled iron wheels have been in service for the past five years without structural failure on axles having an 8-in. wheel fit under ore cars and in constant service on 2 per cent grades.

The question now arises—are we bearing the limit for wheel loads? If so, what is the determining factor? What margin still remains for further increases in bearing power of the metal on wheel and rail, in flange strength and in web and hub. These are the questions we propose to answer by considering each part of the wheel separately.

Bearing Power

The bearing power of iron or steel is largely controlled by the carbon content, and naturally since the tread of the cast-iron wheel contains 3.50 per cent of carbon it has a much greater bearing power than the rail which contains less than 1 per cent of carbon. A 33-in. chilled iron wheel will not perceptibly flatten under a load of 250,000 lb., which is 8 to 10 times the present maximum wheel load. Chilled iron wheels are in common use carrying 100,000 lb. or more under large crane unloading bridges, transfer tables, hydraulic locks, etc. To carry these loads, wide special flat-top rails are necessary.

The ordinary railroad rail with a 12-in. top radius will develop a permanent set when the indentation of the wheel into the rail amounts to 0.007 in. If we assume that the maximum load carried in rapidly moving service should not cause, when at rest, an indentation greater than one-half this amount, the limiting loads from the rail standpoint are readily calculated by the formula

$$L = 1{,}500\,000 d\sqrt{D}$$

in which L equals load, d equals indentation into rail and D equals diameter of the wheels. In this formula the pressure per square inch over the area of contact between wheel and rail is taken at 100,000 lb. per square inch. The limiting loads for various diameters of wheels are:

42-in. wheels	34,000 lb.
36-in. wheels	31,500 lb.
33-in. wheels	30,200 lb.
30-in. wheels	28,800 lb.

As far as the bearing power of chilled iron is concerned there is no indication of nearing the wheel load limit.

The Flange

The pressure which the flange must resist in guiding the truck around curves is equal to three-fourths the wheel load provided the truck is perfect and cars in good condition. The pressure is not influenced by degree of curve, velocity, centrifugal force or obliquity of traction, but an allowance must be made for impacts originating from irregularities in track and locked side bearings and center places which, added to the curve pressure, will make the total maximum lateral pressure against the flange one and one-half times the wheel load, or 18,000 lb. for the 30-ton car and 46,500 lb. for the 85-ton car.

It is unreasonable to suppose that a flange designed for an 18,000-lb. pressure will have the same factor of safety for 46,500 lb. pressure; in fact, the thickness of flange was developed when flange pressure did not exceed 8000 lb. It is just as necessary to increase the flange section as to increase all other sections of the wheel, when increased duty is imposed, and notwithstanding the fact that the Master Car Builders in their latest report stated that no increased flange width was necessary, this matter is by no means settled, as far as other associations are concerned, and a movement has again been started to determine whether the hundreds of thousands of flanges that are now in use (which are wider than the present M. C. B. standard flange), are not entirely in harmony with present track standards.

When this question is answered—the question of track clearance ought to have been answered long ago—we will then have an opportunity to present to the Master Car Builders' Association a flange with a factor of safety proportional to the load carried, which is not a difficult proposition and which from an engineering standpoint is demanded.

Stresses Within the Plate or Web

The University of Illinois has undertaken a thorough analysis of the properties of chilled iron and of the stresses within the wheel originating from all conditions that can arise in service as far as they can be duplicated in the laboratory. These items include

* From a joint address before the Railway Club, Pittsburgh, May 28, 1917, by George W. Lyndon, president, and F. K. Vial, consulting engineer, representing the Association of Manufacturers of Chilled Iron Wheels.

specific gravity, coefficient of expansion by heat, modulus of elasticity, tensile and compressive strengths, stresses in the wheel originating from pressing on the axle, from vertical load, from side pressure on the flange, from difference in temperature between tread and plate—also to discover the probable difference in temperature between tread and plate for continuous application of various shoe pressures at various velocities. An indication of the magnitude of these stresses already has been determined, as follows:

From pressing on an axle, having a 7-in. wheel fit at 60 tons pressure, 18,000 lb. compression per square inch is developed in the single plate; the greatest tensile stress is in the hub. If the machine work is fairly well done, these stresses are symmetrical, but if irregularly machined the stresses will be bunched and necessarily greater than normal, at times sufficient to burst the hub. Under a vertical load of 300,000 lb. the maximum compressive stress occurs on the radial line between rail and hub amounting to about 16,000 lb. in the 725-lb. M. C. B. wheel. The tensile stresses in the tangential direction are about 13,000 lb. These stresses alternate at each revolution of the wheel. The maximum stresses are in the front plate. In the back plate the load stresses are practically nil. The stresses from vertical load within the limits of railway practice are practically negligible.

Temperature Stresses the Greatest

The greatest stresses and therefore the most important are the temperature stresses; for example, a 625-lb. wheel was placed in a brake shoe testing machine and operated at various velocities under a continuous shoe pressure of 1500 lb. This corresponds to the retardation required for a 50-ton car on a 3 per cent grade when operated at 5 miles per hour and on a 2 per cent grade when operated at 30 miles per hour. Thermocouples were placed ½ in. under the surface of the tread, under the rim, at the plate intersection and in the hub. These couples were connected by brushes to a collector ring insulated from the axle so that temperatures could be taken from any part of the wheel at any time without stopping the machine. After running the equivalent of 35 miles the maximum stresses developed near the intersection of plates were found to be:

	Lb. per sq. in.
At 5 miles per hr.	10,000
10 miles per hr.	12,000
20 miles per hr.	15,000
30 miles per hr.	18,000
40 miles per hr.	21,000
50 miles per hr.	24,000

Since the above is a greater retardation than is required for controlling 30-ton cars, it is evident that if the shoe pressure could be made uniform on all wheels of the train there would be no overheating of wheels; but there are so many opportunities for irregularities in service that at least 200 per cent above the theoretical retardation required must be taken into consideration when designing wheels. The test also indicates the great benefit of thermal or cooling stations.

When complete data is worked out for each weight of wheel and the information published in the University bulletins, this study will constitute one of the greatest engineering achievements of modern times.

Making standards for the car wheel which ought to be recognized as the most important part of the car structure without reference to fundamental principles is absolutely unjustifiable.

We may say frankly that the work which has been done in the past eight years by our association, in conjunction with committees and other associations with which we have had to deal, has not yielded us material results. Nevertheless we have gone along in our work with committees, with associations, with Government bureaus, with state universities and with railway clubs, all for educational purposes, firmly believing that we were on the right track and that sooner or later our recommendations would be endorsed.

In these troublous times when the Nation's energy is at the highest state of tension it may be well for all of us to pause for a moment and ask ourselves—what could the railroads do to-day without the chilled iron wheel?

Labor Output and Fatigue

Industrial fatigue and output are discussed by H. J. Spooner in a 50-page pamphlet which has just been published in England, and which is commented on as follows by the London *Ironmonger*.

Mr. Spooner's name is familiar to every draftsman and to many engineers engaged in machine and motor practice. There is one foreword to the pamphlet by Sir Robert Hadfield and another by J. R. Clynes. They agree with the author that, while it is inevitable that the output of Britain must be enormously increased after the war, something must also be done to improve the conditions under which men work and live. In the space of 50 pages, Mr. Spooner passes under review much that has been accomplished since the beginning of the war. Employers interested in the matter, and there should be many such, will find the official investigations relating to fatigue carefully epitomized and much besides on the physiological and psychological aspects of the problem.

The author recommends the reconsideration of shop hours, the reclassification of trades, attention to motion study and the extension of welfare work, and directs attention to a new industrial phase which he calls labor turnover. This last is concerned with the problem of inefficient labor which is continually on the move, and expensive alike to employers and the community. The book, in short, is one of the best things of its kind that has yet appeared, probably because it has been written by a man who is closely in touch with the heart of things and knows the difficulties of the employer, and yet can understand the suspicions of the workers. As he has nothing to gain from either party, Mr. Spooner can hold the balance evenly between them. He certainly is able to show that increased output would not eventually diminish employment, but the reverse. This is a matter which requires constantly to be kept before the workers; but, on the other hand, it is equally necessary to remind employers that under the new conditions likely to prevail profits may be smaller per piece, although there is no reason why the aggregate should not be maintained, and, indeed, increased.

Will Pool Coal Shipments

WASHINGTON, July 17.—To prevent detention of cars at tidewater ports, bituminous coal amounting to about 36,000,000 tons a year will, it is announced by the coal production committee of the Council of National Defense, soon be pooled pending boat shipment at four Atlantic Coast ports—New York, Philadelphia, Hampton Roads and Baltimore.

The plan for pooling coal, it is explained, entails sacrifice by many operators. Coal shipments, it is stated, will be standardized, so that instead of there being 1165 different classifications, each of which requires considerable switching when a boat for any particular kind arrives, coal will now be classified into only 45 kinds. Coal of like kinds, after careful inspection, will be pooled—that is, run on one track—so that when a boat arrives to take a cargo of 100 cars, for instance, of a particular classification from Baltimore to Boston, the first 100 cars of that classification will be run on board and dumped.

Automatic Screw Plant on Pacific Coast

A new plant which is the first built for the manufacture of automatic screw machine parts on the Pacific Coast has been completed by the Western Screw & Lock Nut Co., at the corner of Tenth and Folsom streets in the center of the manufacturing district of San Francisco. It was built primarily to provide adequate facilities for manufacturing the Drake lock nut which was illustrated in THE IRON AGE, Oct. 26, 1916, but the production of screw machine parts as well is contemplated.

The Western Electric Co. has opened three new electrical supply warehouses as follows: New Haven, Conn., 135 Wood Street, Tyler L. Holmes in charge; Baltimore, 425 East Oliver Street, S. Greenfield in charge; Charlotte, N. C., 238 West First Street, R. H. Bouligny in charge. W. H. Quirk has been appointed manager of the company's branch at Cincinnati. W. L. Sioussat will succeed Mr. Quirk as stores manager in the company's Cleveland house.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Price Regulation at Hand

What Secretary Baker gave out in a formal way after the conference between steel manufacturers and Government heads at Washington last week had a fair sound. Prices that will "insure reasonable profits" are to be fixed, he said, and they will be decided upon "with reference to the needs of this vital and fundamental industry." Secretary Baker is understood also to have used the word "liberal" in referring to the margin that will be allowed over the cost of production as determined by the Federal Trade Commission. On its face such an announcement of policy might be called reassuring, but it does not answer the questions the manufacturers and industrial consumers of steel are asking as to the effect Government price-fixing will have on their business in the immediate future. In the first place the extent of the reduction is not yet known; in the second place it is not certain how far it will apply beyond Government needs.

The definite statement that "it is the intention of the Government to distribute the war requirements over the entire iron and steel-producing capacity of the country" might be taken to indicate that the prices fixed will be such as will permit a reasonable profit to the smaller producers in the various lines whose costs are considerably higher than those of the large integrated companies. But that is not certain; for the intimation has been given, apparently on authority, that the Government will see that such producers get their raw materials at less than current prices. That might indicate that the plan at present does not contemplate the fixing of a maximum price on pig iron which shall apply throughout that market. There has even been the suggestion from a Government source that different prices might be paid for finished steel, so as to equalize inequalities in cost. Such a proposal can hardly be meant to be taken seriously. It would involve endless complications and is squarely in the face of the President's call for one price for all.

What is certain is that the fixing of new prices by the Government is at hand—prices it will pay on the steel it buys or that is bought for use on Government contracts. Within two or three weeks, the Federal Trade Commission announces, it will be able to tell what costs are for different forms of finished steel and then the Purchasing Commission will let it be known what prices will be paid.

The Government is not alone in wanting regulation of steel prices. Many producers and buyers of steel have feared the consequences of the ungoverned upward movement of the past six months. Manufacturing consumers in various lines have been coming to the end of low-priced materials and have had to consider whether to enter the gamble and cover their needs at $40 to $50 per ton above the old contract basis. The public has little direct contact with the steel market, but it knew that nails and sheets were enormously high, and the farmer knew that implements were going up beyond any reckoning of recent years. There was growing uneasiness in a number of lines lest the disastrous effects of excessive prices would come even before the beginning of peace parleys in Europe.

The President has called on producers to revise their prices. He has said in effect that when the Government names the prices it will pay for their products they should furnish these products to private buyers at the same figures. He has bounded in a single sentence over every obstacle to such a course by declaring that the public is now as much a partner of the Government as are the Army and Navy.

Yet there are some practical considerations that must enter into such a decision. One concerns the readjustment of contracts already on the books at higher than the fixed price. It is plain that the Government's act in fixing the prices it will pay cannot abrogate such contracts. At the same time what is the position of the buyer who has such a contract as compared with that of his competitor who had not bought ahead, and who, as the President thinks, should be given the same price as the Government? It may be that the number of existing contracts at prices in excess of those that will be fixed by the Government would prove not to be large. All depends on the Government's view of "reasonable profits."

That the Allies shall have the advantage of the Government's prices is also the evident intention of the Administration, but that is a ques-

tion which only time will determine. Obviously "one price for all"—Government, public and Allies—has more chance of becoming the rule if the Government meets half way the steel manufacturers' view of what are reasonable prices for their products. The Allies paid the price for their American loan of 1915, and Great Britain has had and expects a fair return from her allies for her money and her steel. The precedents thus favor a practical view of this question.

The fixing of prices for steel, in view of the wide range of costs, as has been repeatedly pointed out, and the great web of contractual obligations existing, is a serious problem, more serious than some of those who are handling it at Washington seem to realize. What the Federal Trade Commission needs more than cost sheets is information as to the average prices at which steel products have gone from the mill in the past twelve months. From that basis the readjustment, while considerable on some products, plates in particular, would be less violent than from figures representing an investigator's theory of what the market should have been in all the months of war stimulation.

The new prices should not be fixed, moreover, without full consultation with both steel manufacturers and representatives of consuming interests. Manufacturers of agricultural implements, the building trades, the railroads, the railroad equipment companies, the builders of machinery, all should be heard from before the market is put by Government decree on a basis of regulation. The Government needs and should have, on a matter of such far-reaching consequences, the co-operation of manufacturers—not only the manufacturers of steel but all the army of manufacturing consumers whose raw materials come from blast furnaces, steel works and rolling mills. Such a handling of the question of prices in this critical time would mark the beginning of real co-operation between the Government and the makers and users of steel—a co-operation that should continue in a practical way throughout the war and through the period that is to follow, when economic problems of unparalleled difficulty must be met.

War-Time Labor and the Unions

The disgraceful riots in East St. Louis, commented upon last week, have focused attention upon negro labor to an extent that justifies reiteration of the fact that certain industries would be much embarrassed, were it not for the assistance afforded by the colored man. Since the beginning of the war, the supply of labor suitable for common yard work has been very much curtailed, many sturdy men of various nationalities, particularly those from southern and southeastern Europe, having departed to take up arms for their respective countries. There are foundry plants in East St. Louis and in and near Chicago which could not operate were it not for the fact that their coal, coke, and miscellaneous materials are handled by negroes, and it is well they are available, not only for the employer, but also for the skilled mechanic. The latter is quick to protest if there are not sufficient helpers around a plant. He should realize that there must be hewers of wood and drawers of water.

Common labor has been so scarce around Chicago that some foundry managers have been eager to pay 30 cents an hour to those, white or colored, competent to do heavy rough work, and to give them all the overtime they want in the bargain. Not only are they needed for the handling jobs but in cleaning and chipping castings. We have already reported an investigation conducted at St. Louis by the Illinois State Council of Defense, Samuel Insull, Chicago, chairman, which condemns the stimulated migration of negroes from the South to the North and by implication places blame on St. Louis employers by naming them as the "chief beneficiaries" and stating that "the force of motive points in their direction."

It is unfair to implicate industrial managers on such thin circumstantial evidence. Further north than St. Louis, as has been heretofore pointed out, the colored man has come to work on the railroads, but has deserted this work because of the more attractive wages offered in manufacturing plants. Needless to say, he was brought North because the railroads were destitute of common labor for track work, and the higher wages were offered by plant managers because of the scarcity of laborers in their respective lines. The facts present ample justification for the migration of the negroes and for their employment. That the presence of the negroes, even under the circumstances referred to, is not agreeable to the labor unionists is admitted by the Illinois State Council of Defense report when it says: "The colored men * * * were preventing desired improvements being made by labor and threatening the existing standards of labor." When the selective draft becomes operative, and additional thousands of young men, both skilled and unskilled, are taken away from their employment, the labor situation will grow worse. What will be the attitude of organized labor then? Will it insist that only a part of the wheels of industry be kept moving rather than utilize all labor that can be found? Women and girls and boys, with those regular workers who are left, cannot do it all.

Union labor, as shown by the report above referred to, had its share in the East St. Louis riots, and following the trouble there Illinois State troops were called out to control strikers at Bloomington, Ill. In the latter place, the negro question was not involved, but at a time when the nation at large has trouble enough, why should it be necessary to call out troops to control strikers? The striking street car men of Bloomington sought pure and simple recognition of their union. This is not the time for such an agitation, and a conclusion bound to be reached is that some union men and their leaders are not doing their part in the present emergency. As citizens they are at least misguided.

Price Fixing in England

Various opinions are expressed as to the efficacy of the fixing of iron and steel prices in Great Britain. It is pointed out, for instance, that the system of establishing maximum prices did not provide for works expansion and this had to be gotten around by the Government providing funds for new construction. It is suggested also that British buy-

ers had the American market to fall back upon, when they could not secure supplies at home, and that any success achieved would not furnish a criterion as to what would occur in the United States, with no opportunity on the part of American buyers to seek material elsewhere. Then there is another feature, that under certain circumstances at least higher prices prevailed for exports than the domestic limits.

Following are representative British market prices (at £1 = $4.75), changes in the past twelve-month having been very slight:

No. 3 foundry pig, Middlesbrough	$24.39
Bessemer, West Coast	30.28
Standard rails (2.31c.)	51.66
Ship angles, Middlesbrough	2.36 cents
Ship plates, Middlesbrough	2.44 cents
Galvanized sheets (24 gage)	6.10 cents

The control of prices does not seem to have caused any great amount of dissatisfaction in the British iron and steel trade, but there were two circumstances that differentiated British conditions altogether from those obtaining in the United States. In the first place, almost the entire output is being used, in one way or another, for the prosecution of the war, whereas we on this side would have to make a great deal of progress before getting into position to utilize some 35,000,000 gross tons a year of rolled iron, rolled steel and steel castings, for prosecuting war. In the second place, the British producers are allowed to retain only 20 per cent of their excess profits, the balance being collected as taxes, so that the question of profits is only one-fifth as important as it would be if there were no excess profits.

The view of the well-informed London correspondent of the New York *Evening Post* appears to be that price control in England should have proceeded much farther, for he cabled last Saturday:

> Your Government's measures to restrain profiteering command general approval, and are favorably contrasted with ours. Lack of control here is largely responsible for the increased cost of the war, and palpably increases the difficulty of financing. However, we are less favorably placed than you, who actually produce most commodities whose prices you seek to control. That fact alone suggests greater success for your measures. The attempt to assure the same prices to the public as to the Government is regarded as wise, for the rise in the cost of living here always militates against subscriptions to the war loans, by reducing the margin of income available for investment.

Early last month an advance of 5 shillings was allowed by the Ministry of Munitions in prices of certain descriptions of Staffordshire pig iron, but not, according to the *Iron and Coal Trades Review*, London, until the books of the furnaces had been showing a loss. The price of most grades of furnace coke was fixed last year at the equivalent of $5.45 per net ton at ovens.

Very little information has been available as to difficulties experienced by the British authorities in distributing or "allocating" the supplies of material, after the price had been fixed. That, perhaps, has been the most difficult part of the job, and certainly the difficulty would be greater in the United States. As has been pointed out in these columns, the regulation of deliveries—determining who is to have such steel as is available after direct Government needs have been supplied—is as important as the regulation of prices.

Progress in Electric Steel

Great strides have been made in the last few years, and particularly in 1916, in the world's production of steel in electric furnaces. Great Britain last year more than doubled her 1915 output while Germany increased nearly two-fold her 1913 record production. Canada stepped into prominence by making more electric steel last year than France, the home of the electric furnace, and Austria-Hungary doubled under war conditions her production of 1915. The output of the leading countries, at roundly 490,000 tons in 1916, was over twice that of 1915 and nearly three times that of 1913 when other steel production records were broken in most countries.

The United States has made the most rapid advance, and to-day leads by far any other country both in output and number of furnaces. While the 1916 output did not equal that of Germany, as expected, the rate of expansion in capacity was greater than in all other countries, having been last year two and one-half times that of 1915 and between five and six times that of 1913.

On July 1 it is estimated that the electric steel output of the United States was easily at the rate of 200,000 tons per year and by Jan. 1, 1918, if the furnaces now under contract are producing, it will reach 300,000 tons and outstrip any other country. On Jan. 1, 1917, the annual statistics of THE IRON AGE showed the United States to have 136 electric steel furnaces operating or contracted for, with 19 in Canada. Six months later, or early this month, conservative estimates place the United States total at not less than 165, with the total for this country and Canada not less than 210. This is a growth of over 30 per cent in six months.

It is hard to assign bounds to the further use of the electric current in steel making. The development has already exceeded the most optimistic predictions of only three years ago. Added to all is the growing use of electricity in the treatment and heating of steel, which is rapidly achieving results not thought possible only a few years ago.

CORRESPONDENCE

Industrial Workers and Medical Inspection

To the Editor: I read with considerable interest Magnus W. Alexander's recent article in THE IRON AGE, which appeared almost at the same time as a small contribution of my own to the *Railroad Herald*, on the subject of "Medical Inspection and Industrial Man Power."

Your issue of June 14 contains an article on "Industrial Medical Service of the Future," taken from an address made by a member of the American Medical Association, which well expresses the aims and views of that body, and I hope to see further comment in your columns on the subject. Under the admirable teachings of the American Medical Association the average man is beginning to wonder as he reads his

paper if America has not become a plague spot, and whether it is safe to appear on the streets without dropping in on some "regular" physician for advice.

Under the cry of "Health! Health! Health!" the matter of Sickness! Sickness! Sickness! is being constantly dinned into all ears.

If the recommendations in the article in question were carried out it would mean that from the cradle to the grave no man would enjoy industrial or private independence from the domination and direction of a medical autocracy. I grant that there are some, possibly many, who are deficient in household sanitation. But what of the man and woman who are not deficient, and yet at any time would have to admit the medical intruder into their home, show him the contents of the ice box, tell him how often the kitchen sink is disinfected, explain how the bed linen is aired, and expose all the privacy of home life to his critical gaze, and then stand aside like children to receive his commendation, or his reproof and instructions.

It is proposed that when a worker absents himself from his duties the medical inspector will immediately seek him out in his home, and report to his employer as to whether he is necessarily absent from ill health, or is out from some other cause.

Do you have any idea that labor, once it wakes up to the completeness of the domination that these modern (but dollar-wise) Don Quixotes propose to extend over industrialism, and over the private lives of workers and their children, will in any sense submit? Can anyone imagine Americans tamely submitting to so odious a condition? I think that rather the pendulum will swing to the other extreme, and that much of the real good that has been accomplished by the American Medical Association in the way of standardization will be undone, and the usefulness of medical science set back a decade.

The railroads of the country in days by-gone rode blithely rough-shod over the wishes of the people, merrily sowing the wind—and what a whirlwind the poor railroads have reaped, and are still reaping. Let the American Medical Association take warning, and if they have anything good to offer, offer it freely—but beware of trying to cram it down unwilling throats.

R. C. BROWN.

Mechanical Department, Georgia Railroad,
Augusta, Ga., June 25, 1917.

Increasing Naval Employees

WASHINGTON, July 17.—The civilian mechanical force at navy yards and other naval establishments has been increased since April 1 from 25,000 to about 35,000, according to a statement issued by the Civil Service Commission, through whose agency this increase has been effected. Concerning the work of the commission in co-operating with the Government in securing employees, and especially with reference to the safeguards adopted to prevent the disorganization of private manufacturing enterprises, an official statement in part as follows has been promulgated:

Of approximately 10,000 men appointed, 8500 have registered for employment with the commission's local boards of examiners at the yards and stations, and the remaining 1500 have been certified through the direct efforts of the commission at Washington and its agents in the field.

Of course, not only the Government is to be considered at this time. Private enterprise engaged in furnishing material to the Government must have the labor necessary to fulfill its contracts, and in order not to interfere with the work of these establishments the commission's agents are instructed not to make an offer of employment in a Government plant to a man engaged upon a Government contract without the consent of his employer.

In addition to meeting immediate calls, the commission has enrolled about 35,000 mechanics whose services are not needed in Government plants at this time but who have expressed their willingness to accept Government employment.

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Price Regulation in the Wire Nail Trade

An interesting development which throws a strong light on some phases of price advances in iron and steel is seen in the wire nail trade. For some time, as market reports have indicated, the American Steel & Wire Co., which produces approximately one-half of the wire products of the country, has continued to sell wire nails at $3.20 per keg, while sales have been made by various independent producers at $4. The situation in wire has been like that in many other products, the bulk of the current shipments being at prices considerably below the $4 level, even in the case of independent producers. At the same time, as the prompt or premium market went to $4, the jobbing trade began basing its sales to retailers on the $4 price at mill. Thus in some cases $4.50 and as high as $4.75 were charged on sales to retailers, some business in the Philadelphia district being done at $5.

The American Steel & Wire Co. having made an effort to hold prices in check to guard against the inevitable reckoning which follows an ascent of the market to unusual levels, considered that the advances asked by the jobbers were unreasonable and so informed many of its customers. The result was a readjustment of prices by jobbers, so that a spread of from 40c. to 60c. a ton was made between the $3.20 mill price plus freight and the selling price to retailers. For the most part the readjustment gave the jobbers a 50-cent profit. As was to be expected, irregularities have developed, due to the competition of nails sold to retailers by some jobbers at $3.75 to $3.95, with nails for which other jobbers paid $4 on prompt orders from mill. The movement for reasonable prices thus started by the leading producer is apparently aided by the position the Government is taking respecting the whole range of prices for steel products. The $4 mill price for nails is still maintained by some sellers and the supply is not fully equal to the demand, partly in view of the fact that billets and rods are fully as remunerative to the mills as product in the more advanced form.

The method, as outlined above, of checking advances to the ultimate consumer, has had the approval and cooperation of many members of the jobbing trade, and the resulting situation has made the move the most widely discussed development in the wire nail trade in years.

Record Exports of Copper

Exports of copper from the United States in the first five months of this year exceed any previous record and nearly equal the total of 1915, due largely to the large Allied contracts taken last year. To June 1, 1917, they have been 225,582 gross tons against 108,348 and 119,551 tons for the corresponding months in 1916 and 1915 respectively. The 1917 and 1916 exports have been as follows in gross tons:

	1917	1916
January	51,322	23,663
February	32,265	20,648
March	51,218	26,321
April	49,536	21,654
May	45,241	16,062
Totals	229,582	108,348

The total exports in 1916 were 327,310 tons, but only 276,344 tons in 1915, showing the relatively large exports so far this year. Before the war exports ran to 382,810 tons in 1913.

Imports of copper to June 1, 1917, have been 96,500 tons against 84,000 tons to June 1, 1916.

The Winchester Repeating Arms Co., New Haven, Conn., which has Government contracts reported to aggregate $100,000,000, has announced a wage increase of 10 per cent. In some cases employees' workday was reduced an hour or an hour and a half in addition. About 16,000 men are employed, and a night shift of 10,000 more will be added soon.

Many Permits Issued

WASHINGTON, July 17.—The Exports Council announce that up to Saturday night, July 14, 5210 applications for export licenses were considered and all of them acted upon before the close of business on Monday, the 16th inst. Two copies of every export license are given to every applicant who is granted the license. He, in turn, delivers these licenses to the steamship company handling the shipment, and the steamship company, in turn, deposits them both in the custom house with the manifest. This enables the custom house to keep one copy for its records. Another copy goes forward with the ocean documents to destination, and the stub of the original is returned by the custom house, properly filled in, so that the Division of Export Licenses can check back what shipments have been made against the license issued.

The Exports Council has issued a ruling in which it holds that the following articles are included within the scope of the President's recent proclamation requiring licenses for exports of certain merchandise including specified iron and steel products: Structural steel, shapes and milled steel, including angles, tees, beams and channels; plates of ordinary tank quality and rolled steel floor plates.

New Steel Plant in Portugal

The Portuguese Government intends to sell by tender a concession for 15 years for the exclusive right of establishing in Portugal a modern iron and steel works. The concessionnaire must install at his own cost a modern iron and steel plant comprising blast furnaces, steel furnaces, rolling mills, presses, shearing machines, wire-drawing plant and any other necessary accessories for an initial annual production of at least 100,000 tons of iron and for the manufacture of iron and steel bars, plates, sheets and rails. The establishment must be in working order within a period of five years from the date of the granting of the concession. The government will grant land for the erection of the works and exemption from industrial and other taxes. The concessionnaire will be able to import free of customs duty all plant and materials which cannot be satisfactorily acquired in Portugal during the first five years of the concession. The government will also authorize the construction of railroads, up to 15 kilometers, to connect the new works with the state railroad lines in the vicinity.

Large Orders for Locomotives

Orders for locomotives in the past two weeks call for a total of 708 and for an estimated expenditure of over $20,000,000. The Russian Government has ordered 500 decapod locomotives, divided equally between the American Locomotive Co. and the Baldwin Locomotive Works. The British Government has ordered 100 consolidated locomotives from the Baldwin Locomotive Works and the same company will furnish 100 locomotives for the Atchison, Topeka & Santa Fe, most of them for delivery in 1918. The Boston & Maine Railroad is reported to be inquiring for a large number. These new orders bring the total for the present year to 4271, probably over one-third of these for export. The number of locomotives needed by roads in this country is variously estimated at from 5000 to 8000 annually, but on the basis of purchases made in the first half of this year buying is proceeding at the rate of less than 3500 locomotives a year.

Work Stopped on New Cambria Plate Mill

Because of the scarcity of labor for mill operations and the increasingly high cost of materials, the Midvale Steel & Ordnance Co. has issued an order in the past week discontinuing construction work on the new 132-in. plate mill at its Cambria plant at Johnstown, Pa.

About 250 boiler makers at the plant of the Lake Erie Boiler Works, 230 Chicago Street, Buffalo, and five other shops, declared a strike July 10 for an advance in wages.

Dr. Pratt Resigns from Commerce Bureau

Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, has sent his resignation to Secretary of Commerce Redfield. Dr. Pratt says in his letter to the Secretary that: "I would have regretted leaving the Bureau of Foreign and Domestic Commerce at any time, but I particularly regret it at this time because of the war activities that have been placed in its care." There is said to have been a difference of opinion between the Secretary of Commerce and Dr. Pratt on the question of exports control. Dr. Pratt was recently appointed a member of the Exports Council, and is reported to have favored a more liberal interpretation of the new law than Mr. Redfield. The latter is understood to want drastic restriction on exports to Scandinavian countries and Holland. Dr. Pratt has borne the reputation of one of the leading experts on foreign trade in the Department of Commerce.

Employing More Women

The employment of women in Youngstown plants in the Youngstown, Ohio, district is steadily increasing. The General Fireproofing Co. has already in its employ a large number of women engaged in running punch presses and doing bench work. The shortage of men, due to the war and other causes, and the abnormal demand for the products of this company, are given as the reasons for its employing women to do work formerly done by men, the women doing the lighter work in this plant. The General Fireproofing Co. manufactures metal furniture, metal lath and fireproofing materials. A factory extension with two acres of floor space to be devoted to metal furniture production will be completed within two weeks. On that account, a largely increased number of women will be required.

The German Steel Output

Germany's pig iron and steel output in May of this year was very large, according to statements in the *Kolnische Zeitung* and printed in the London *Ironmonger*. In some plants it even reached the peace level, while deliveries were also larger. No official figures are given, however.

The Humphryes Mfg. Co., Mansfield, Ohio, has been sold to a new company bearing the same name, whose officers are W. G. Moore, president; O. M. Gates, treasurer; R. G. Femsch, assistant treasurer and purchasing agent; George K. Byrd, secretary and sales manager, and J. G. Groscost, assistant secretary and assistant sales manager. The board of directors consists of A. E. Duncan, chairman; W. G. Moore, O. M. Gates, George K. Byrd and Reid Carpenter. Mr. Duncan is a member of the firm of Robert Garrett & Sons, Baltimore, and Mr. Moore is associated with the same concern as consulting engineer. It is the intention of the new company to continue the manufacture of hand and power pumps, sanitary and special enameled ware and plumbers' brass goods. Steps will be taken to increase the output and effect more efficient operation. The company employs about 300 men. Accompanying announcements of the change which have been sent out to the trade is an interesting booklet entitled "Battle Fields of To-day," which comprises a set of war maps in colors, showing gains and losses in territory and other interesting statistics.

The Seattle, Wash., Port Commission has leased for 20 years several tracts of land, which will be utilized by concerns in the metal-working industries. Gray & Barasch are to put up a machine shop on a site embracing 29,000 sq. ft. A brass foundry is to be erected on another plot. The Hendricks Mfg. Co. is erecting a machine shop on a plot of 29,600 sq. ft. The Aurora Foundry Co. is erecting a foundry building on a plot of 24,400 sq. ft. The Olympic Steel Co. and the Star Machinery Co. have leased two other plots.

Cementation by Gas Under Pressure

Research work of a practical nature was discussed by F. C. Langenberg of Harvard University, Cambridge, Mass., in a paper, "Cementation by Gas Under Pressure," presented before the annual spring meeting of the Iron and Steel Institute in London, England, May 3, 1917. A brief abstract follows:

A special form of furnace was used, combining all the requirements of a vacuum and pressure furnace in a single unit. The detailed description of this furnace should be of value to other investigators, for the general arrangements make it applicable to a much wider range of work than the particular investigations of the author.

In the experiments the material subjected to carburization was ingot iron of the following percentage composition: Carbon, 0.01; silicon, 0.002; sulphur, 0.002; phosphorus, 0.003 per cent, with a trace of manganese. The gases used were illuminating gas and acetylene. The samples of iron to be cemented were turned down in a precision lathe to a uniform diameter (within 0.001 in.) and were approximately 0.45 in. in diameter and 0.85 in. in length. Every sample was accurately weighed and measured before and after treatment. Where no oxidation occurred the change in weight was a sufficiently accurate measure of the carburization ensuing. For purposes of comparison this change of weight was divided by the area of the specimen, introducing a column in the data tables, "change of weight per square centimeter of surface."

Twelve series of experiments were carried out, of which particulars are given in the paper, and the author concludes by pointing out that the gamma-beta points seem to mark a sharp break in the carburization curves for both town gas and acetylene; no carburization ensued below 720 deg. C.; and the effect of pressure on the degree of carburization with the gaseous systems found in illuminating gas was different at different temperatures, the various curves indicating that after a certain pressure is reached further increase of pressure will not cause additional absorption of carbon by the iron.

Bethlehem Steel Corporation in Court

The Bethlehem Steel Corporation appeared in the United States District Court at Trenton, N. J., on Monday of this week in two litigations. Judge Rellstab heard argument in the case of Clarence H. Venner of New York to set aside the transfer of the property of the Pennsylvania Steel Co. to the Bethlehem corporation. The corporation filed an answer to the suit of the General Investment Co. to restrain it from guaranteeing the assets of the Pennsylvania Steel Co. and its subsidiaries. In its answer the Bethlehem corporation said that the plan of guaranteeing the bonds of the Pennsylvania Steel Co. was approved after the consent of more than two-thirds of the stockholders had been obtained, as is provided in the charter of the Bethlehem corporation.

The Superior Steel Corporation, Union Arcade Building, Pittsburgh, is in the market for spot shipment, for a 1500-kw. mixed flow pressure turbine of from 230 to 250 volts. The company would buy a second-hand turbine, if it is in good condition. Communication should be addressed to Superior Steel Corporation, H. F. Devens, vice-president, Union Arcade Building, Pittsburgh.

The E. C. Humphreys Co., dealer in pig iron, ferroalloys, non-ferrous metals, clay products and molding and sand blast sand, will remove on Aug. 1 from 445 Howard Street, Detroit, to 1201 Book Building, Washington Boulevard. Offices will be opened at 556 Leader-News Building, Cleveland, and 1501 Arrott Building, Pittsburgh, at that time.

The Ashland Iron & Mining Co., Ashland, Ky., has announced an increase of 2½ per cent in the wages of employees in its open-hearth steel plant. This advance brings the rates of common labor to $2.50 a day.

Iron and Steel Markets

NEW BUSINESS HALTED

Extent of Federal Price Fixing in Doubt

Regulation of Wire Nail Profit to Jobbers—Government Buying Increases

Announcement of the result of the conference at Washington last week between Government heads and the committee of steel manufacturers gave an abrupt check to business in iron and steel on any large scale. The vague ideas the trade has entertained for some weeks of possible readjustments that would have far-reaching effects were sharpened into real prospects by the President's message to business calling for the same prices to the public as those fixed by the Government.

Steel producers have expected to accept special prices from the Government and to have its requirements take up an increasing share of their output, but Chairman Gary in his address to the Iron and Steel Institute late in May said that they also expected that as costs of production were advancing the Government would be willing to increase its purchasing prices accordingly. The conference at Washington not only pointed in the other direction, but also foreshadowed an effort by the Government to get like low prices for its allies, whereas the latter would pay more, being chiefly concerned to get the steel.

The effect on buyers was just what was to be expected. Throughout consuming industries the one policy is the postponement of buying until the Federal Trade Commission's cost-finding inquiry is finished.

That a real readjustment of prices will begin in the interval of two or three weeks required by the commission is not likely, since it is well known that first concessions do not produce business; but there has been a tendency to weakening in the past week in pig iron, scrap and coke, and the trade has not found it difficult to believe that the crest has been reached and passed.

There is much speculation as to the effect of Government price fixing on the market for finished products in which its purchases are a negligible fraction of the output, as rails, pipe and tin plate. For plates and shapes, in which Government requirements will be large, it is recognized that the private buyer would pay dearly if there were no regulation of the price for what remained for general use.

It does not appear to what extent ore, coke and pig-iron prices are to be subjects of the Government's regulation, since it will not be a buyer of these, having already covered its pig-iron wants for the present at a low price. Coke readjustment presumably will come with lower coal, and such readjustment will be welcome, as coke has gone to five or six times the basis of ordinary times.

The embargo on exports of certain steel products has already held up some shipments, but the problem of vessel space is far more the controlling factor in exports. The uncertainties as to export license affect millions of dollars' worth of product against which irrevocable credit has been arranged. Mills will have to decide whether rollings shall proceed, leaving the buyer to dispose of the product where shipment abroad cannot be made.

Mill output has been at a less rate in July than in June, and June product fell off considerably from that of May. Heat and reduced effort of workmen have told on production and there is looming up the effect of the draft. Due to scarcity of labor for works operation and to high prices for material, work has been stopped on a new plate mill at Johnstown, Pa. At Birmingham, it is just announced, a plate mill will be a feature of the new construction.

A Russian order for 500 decapod locomotives has been divided between the two makers and the Santa Fe has bought 100; thus locomotive works are faring rather better than car companies. The latter have suffered from inability to get material, and therefore would welcome Government handling of the proposed building of 100,000 cars for domestic railroads. For the present that project has been laid aside. Current car orders include 1500 for the H. C. Frick Coke Company and 1000 for the Canadian Government.

A practical effort by the leading producer to hold prices in check has developed in the wire trade. The American Steel & Wire Co., which has continued to sell wire nails at $3.20 while the market has gone to $4, has indicated to jobbers that a reasonable profit to the latter is 50 cents, rather than $1 and as high as $1.50, as charged in some cases. The result has been a readjustment to a $3.75 to $4 basis in jobbers' sales to the retail trade.

Structural contracts fell off in June to 47.5 per cent of the capacity of the fabricating shops, the smallest month's business since July, 1916.

Government work is reaching a widening circle of manufacturers. One notable operation, of which no mention can be made in detail, calls for 73,000 tons of sheets.

The decline in prompt furnace coke amounts to at least $2 and heavy melting scrap at Pittsburgh is $3 a ton lower, these representing the week's definite price changes.

Car shortage at lower Lake ports has held up ore boats and at the mines ore has had to go on stockpile instead of going forward. On the Mesaba range some steam shovels have stopped.

Pittsburgh

PITTSBURGH, July 17 (*By Wire*).

The past week in the local steel market was the dullest we have had at any time in two years and prices on pig iron and some lines of finished steel, also on scrap and coke, are showing a decidedly weakened tendency. This all comes from the uncertainty as to the final action to be taken by the Government in fixing prices on pig iron, semi-finished steel, scrap, coke and on many lines of finished steel. The statement of President Wilson last week that the Government might regulate prices, not only on its own purchases but on sales made to domestic consumers, has put the whole market at sea, and no one knows what is going to happen. The belief is strong here that the Government will not attempt to dictate prices at which iron and steel products shall be sold to domestic consumers, but will name prices that it will pay for pig iron and other materials, and that the blast furnaces and the steel

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 18, 1917.	July 11, 1917.	June 20, 1917.	July 19, 1916.
No. 2 X, Philadelphia...	**$54.50**	$53.00	$49.75	$19.75
No. 2, Valley furnace...	55.00	55.00	53 00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	46.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	44 00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	52.00	19.00
Basic, del'd, eastern Pa.	50.00	50.00	48.00	19 00
Basic, Valley furnace....	53.00	53.00	50.00	18.00
Bessemer, Pittsburgh ..	57.95	57.95	55.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	52.00	19.50
Gray forge, Pittsburgh..	47.95	47.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	52.00	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	100.00	100.00	100.00	40.00
O.-h. billets, Pittsburgh.	100.00	100.00	100.00	42.00
O.-h. sheet bars, P'gh....	105.00	105.00	105.00	42.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	110.00	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh...	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.00	2.35
Steel bars, Pittsburgh....	4 50	4.50	4.50	2.50
Steel bars, New York....	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh..	9.00	9 00	8.00	3.50
Tank plates, New York .	**10.169**	9 169	8 669	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6 00	6.00	2.45
Steel hoops, Pittsburgh..	5.25	5.25	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 18, 1917. Cents.	July 11, 1917. Cents.	June 20, 1917. Cents.	July 19, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.00	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	9.75	4.25
Wire nails, Pittsburgh..	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$44.00*	$45.00	$47.00	$18.50
Iron rails, Philadelphia..	*45.00*	52.00	50.00	20.00
Carwheels, Chicago	*35.00*	37.00	43.00	12.00
Carwheels, Philadelphia..	*35.00*	38.00	35.00	15.00
Heavy steel scrap, P'gh.	*38.00*	40.00	42.00	16.50
Heavy steel scrap, Phila.	*32.00*	40.00	37.00	15.00
Heavy steel scrap, Ch'go.	*32.00*	34.00	39.00	14.00
No. 1 cast, Pittsburgh....	*32.00*	34.00	37.00	15.75
No. 1 cast, Philadelphia.	*35.00*	37.50	32.00	16.00
No. 1 cast, Ch'go (net ton)	*28.50*	29.50	32.00	11.50
No. 1 RR. wrot, Phila....	*48.00*	55.00	55.00	19.50
No. 1 RR. wrot, Ch'go (net)	*37.00*	39.00	44.00	15.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$11.00*	$13.00	$11.50	$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	*12.00*	14.00	12.00	3.25
Foundry coke, future....	10.00	10 00	10.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	*26.50*	30.75	32.50	25.25
Electrolytic copper, N. Y.	*26.50*	30.75	32.50	25.00
Spelter, St. Louis.....	*8.62½*	8.87½	9.50	9.00
Spelter, New York.....	*8.87½*	9.12½	9.75	9 25
Lead, St. Louis.....	*10.37½*	11.00	11.50	6.10
Lead, New York.....	*10.50*	11.12½	11.75	6.25
Tin, New York.....	*62.50*	63.00	63.50	37.25
Antimony (Asiatic), N. Y.	*16.00*	17.00	19.00	14.00
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$11.00	$6.00

mills will accept the decisions, feeling it is their patriotic duty to do so. Until more definite word comes from Washington, the market is likely to remain dormant and very little material will be sold. Furnaces are afraid to sell pig iron, consumers will not buy, and the pig iron market is at a standstill. Early last week, there were sales of Bessemer at as high as $57 and $58 and of basic at $53 to $54, but it is certain these prices would not be paid to-day. The fact that for some time the Government has been furnished sheets from $25 to $40 per ton under the regular market perhaps indicates that the Government expects to buy pig iron at proportionately low prices and other materials as well. It is reported that recently a considerable lot of foundry iron was bought by the Government at as low as $35 per ton at furnace. There have been no decided changes in prices on finished steel, but coke is at least $2 per ton lower, while scrap is off $2 to $3 per ton and is very weak. Should present conditions continue for two or three weeks, a serious decline in price in pig iron, semi-finished steel and on some lines of finished steel would, no doubt, result. As it is now, there is a deadlock, and there is practically no buying or selling, so that values are largely nominal. Should the Government decide it has not the power to fix prices on iron and steel materials to be sold direct to consumers, it would probably result in a decided upward movement in prices on materials that now are very much depressed, especially pig iron, scrap and coke. On finished steel, the mills are sold up so far ahead that it is not believed any decline in prices will come nearly as soon as in pig iron and other raw materials. The whole market will simply mark time until the Government attitude on prices is definitely known.

Pig Iron.—The local pig-iron market is a good deal disturbed, and prices have been made weaker to some extent by offerings of resale iron at prices $2 to $3 per ton lower than those that are being named by the furnaces, and at which sales of both Bessemer and basic were made just before the announcement of President Wilson regarding fixing prices. Some New York brokers had about 7000 tons of Bessemer iron in New York for export shipment, but when the railroads declared the embargo on foreign shipments of pig iron, and in fact nearly all steel materials, the 7000 tons of Bessemer was very quickly offered in this market for resale and 3000 tons have been sold to a leading steel casting interest at the reported price of $55, delivered. There have been other smaller sales of Bessemer iron held by dealers at $55 and perhaps less. It is claimed that Bessemer iron has been offered at as low as $53.50, Pittsburgh, but this is evidently resale iron that parties holding desire to dispose of as quickly as possible. Careful inquiry among producers of pig iron indicates that none of them is offering Bessemer or basic iron at lower prices than have ruled for several weeks past. They feel it is not an opportune time to endeavor to force sales of iron and will not do so until the Government attitude as to prices is definitely known. About a week ago, an open-hearth steel plant in the Wheeling, W. Va., district bought 5000 tons of basic iron for fourth quarter delivery at $53, Valley furnace, and another interest has bought 5000 tons for first half of next year at the same price. We also note a sale of 500 tons of malleable Bessemer iron for this year's delivery at $55, Valley furnace, and several small lots of foundry iron at $55, at furnace. The pig-iron market from the furnace point of view is strong, but as stated above, Bessemer and basic that are being offered for resale are disturbing the market and may result in lower prices all around.

We quote Bessemer iron at $57 to $58; basic, $53 to $54; malleable Bessemer, $53 to $54; No. 2 foundry, $55 to $58, and gray forge, $47 to $48, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—Both Youngstown and Pittsburgh steel mills took a large part of the 85,000 tons of shell steel recently placed by the Government for quick delivery, reported in THE IRON AGE of June 21, and are turning it out as fast as possible, and shipments on part of it have already gone forward. The general steel market, like pig iron, has come to a halt, and it is not likely much will be done until the Government states definitely what it is going to do in the matter of prices. Deliveries of billets and sheet bars by the mills are reported better, due to a larger car supply. We note a sale of 200 tons of ordinary carbon forging billets at about $128, delivered to consumer's mill.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $165 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Ferromanganese.—Consumers are evidently well covered over the remainder of this year as new inquiry is dull, and prices are weaker. For delivery over last half of this year, we now quote 80 per cent ferromanganese at $375 to $400, and for first half of next year $325 to $350 at maker's furnace. Small lots of 50 per cent ferrosilicon are reported as bringing $200 to $225, delivered, for spot shipment. We continue to quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton at furnace. The new demand for Bessemer ferrosilicon and silvery iron is only fair, consumers being well covered over remainder of this year.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent, $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—No new business is being placed in standard section rails, but the new demand for light rails is very active and they continue to bring very high prices. It is said that several lots of 25 to 45-pound rails have been sold at about $90 per ton at maker's mill, for prompt delivery. Prices on new light rails and on standard sections are given on page 166.

Structural Material.—Local fabricators state they are not bidding on much new work, desiring to conserve as much of their output as possible for Government needs. The 2400 tons wanted for the armor plate and projectile Government plant at Charleston, W. Va., have been held up, as it is understood the Government will not go ahead actively with the erection of this plant during the war. The McClintic-Marshall Co. has taken 850 tons for Government work at Saint Julians Creek, Va., and Pensacola, Fla. This concern, the American Bridge Co. and other local fabricators are doing a large amount of Government work about which details have not been given out. Prices on structural shapes are given on page 166.

Plates.—The Government is taking more and more of the output of local plate mills, making it harder than ever for domestic consumers to get plates. One leading interest is said to be giving the Government from 50 to 60 per cent of its total output of plates, and another large maker 25 per cent or more. No large orders for steel cars are being placed. It is said that two leading steel car companies are not getting deliveries on more than 25 per cent of the plates they need, and this may grow less as the Government demand gets larger. There would be no trouble in selling ¼-in. heavier sheared plates for delivery over this year at 10c. at mill or higher, and the mills are turning down business of this kind offered to them nearly every day.

Sheets.—Direct and indirect Government orders for sheets of all grades in June amounted to a little over 15,000 tons, and for July promise to be larger. By reason of the close co-operation of the sheet mills with the Government, through the subcommittee on sheets, the Government has been getting promptly all the sheets it has required, and at prices from $25 to $40 per ton under regular market prices. In the month of June, it paid 6.25c. for blue annealed sheets, 8 50c. for galvanized and 6.50c. for Bessemer black, all of No. 28 gage, and these prices will also apply on July shipments. The Government has never fixed prices it will pay for sheets, the mills entering Government orders at the above prices, which were evidently satisfactory. On the average, the above prices are close to $40 per ton less than ruling market prices being charged to domestic consumers. The current demand for sheets is heavy, and with the sold up condition of the mills, deliveries to domestic consumers are very slow. Several of the larger sheet mills have been practically out of the market for several months as active sellers, obligations already on their books taking practically all the sheets they could make over the next three or four months. Mill prices for carloads and larger lots over which premiums are sometimes paid for fairly prompt shipment are given on page 166.

Tin Plate.—Much larger quantities of bright plate are now going forward to packers of non-perishable foods than for several months. The embargo against shipments of bright plate, except to packers of perishable foods, has been practically removed, and the supply of bright plate for packers of perishable foods this summer and fall will be ample to meet the demand. Tin plate mills for months have been making the largest output in their history, and while packers of vegetables and fruits this summer will be extremely busy, the tin plate mills will be able to supply the plate to take care of the demand. Not much talk has been heard recently of any attempt to work one or two turns in tin plate mills on Sundays, and in view of recent developments it is not believed this would be attempted. The American Sheet & Tin Plate Co. has started three or four new double hot tin mills at its Farrell and Shenango works, and this will very materially increase the output of plate of this company. The inquiry of the Italian commission for 100,000 boxes of tin plate and the other inquiry from J. P. Morgan & Co. for 84,000 boxes have not been placed. It is probable our Government will ask that tin plate needed by our allies will be furnished by American mills, if it is possible to do so. It is likely England will be a very heavy buyer of tin plate in this country, as it is said tin plate mills in Wales are not turning out more than 40 per cent of the regular output. Current demand for tin plate is fairly active, and mills are charging $11 to $12 per base box for primes for shipment from stock. The new demand for terne plate is dull, nominal prices being given on page 166.

Iron and Steel Bars.—Mills report the demand for reinforcing and steel bars as very heavy. The Government has been an active buyer for some time of all sizes, ranging from ⅜ to ⅞ in. The larger sizes probably are to be used for fortifications. It is said that reinforcing bars are selling at 4c. and higher at mill. The current demand for both iron and steel bars is showing a large falling off, due to the uncertainty as to whether the Government is going to fix prices on both Government and domestic purchases. Larger consumers are supplied freely against contracts, and the output of steel and iron bar mills is well under contract for the remainder of this year. Prices on iron and steel bars being quoted by the mills in carloads and larger lots to regular domestic customers are given on page 166.

Hoops and Bands.—There are no fixed prices on either hoops or bands. The large consumers are covered and most of the new business is in small lots for fairly prompt delivery. Steel hoops still range from 5½c. to 6c. and steel bands from 5c. to 6c. at mill to regular customers only. Small lots of steel hoops for prompt shipment have sold at 7c. and higher and steel bands, rolled from special steel, have sold at 7.50c. at mill.

Muck Bar.—There is no new demand, but $100 per ton could probably be obtained for high grade muckbar made from all pig iron.

Wire Rods.—Several of the larger makers are practically out of the market as sellers. They need their entire output of rods for regular trade and probably part of it for Government's needs. Shipment of rods to Canada on contracts made some time ago are still going forward. Lately several small lots of soft Bessemer and open-hearth rods have been sold at $95 to $100 at maker's mill. Rods, rolled from special quality

of steel are sold all the way from $110 to $120, maker's mill. Prices on rods are given in detail on page 166.

Wire Products.—It is said the complications in the jobbing trade over the wide range in price on wire and wire nails for several months are increasing. Jobbers who are paying on the basis of $4 for wire nails and $4.05 for bright basic wire are complaining that they are losing part of their trade to competitors who have been getting nails at $3.20 and bright basic wire at $3.25 f.o.b. at mill, Pittsburgh. How this confusion in the trade will be adjusted is a question, but it is said a movement has started to try to induce independent makers of wire and wire nails to reduce their prices, in order to put their distributors on an even basis with competitors. It is said the recent orders of the Government for 41,320 kegs of wire nails, distributed among the mills, has been practically all filled and shipped. The new demand for wire and wire nails is only fairly active, the trade not showing a keen disposition to buy, in view of the possible fixing of prices on wire and wire nails by the Government on its own purchases and to domestic consumers as well. The American Steel & Wire Co. here is still quoting wire nails to regular customers at $3.20 per keg, and $3.25 on bright basic wire per 100 lb., but has not been actively seeking new business for several months. Details of prices on wire and wire nails being quoted by the independent mills are given on page 166.

Shafting.—Makers report the new demand only fair, most consumers being covered for the remainder of this year, and specifications against contracts are fairly active. The price for shafting is firm, ranging from list to 10 and 5 per cent off, depending on the quantity and delivery wanted.

Railroad Spikes and Track Bolts.—The Pennsylvania railroad company is reported to be in the market for 12,000 kegs of spikes for delivery over the remainder of this year. The new demand has been quiet for some time, most roads being covered over this year, and specifications against contracts are only fairly active. The new demand for track bolts is reported to be heavy. Prices in effect on railroad spikes and track bolts are given on page 166.

Cold Rolled Strip Steel.—Makers report the new demand as heavier at present than ever before in the history of the cold rolled strip steel trade. The Government is reported to have been placing some fairly large orders. The new demand from domestic users is heavy. There is some disposition on the part of the buyers to hold off placing orders until they know definitely whether the Government will fix prices on its own purchases and also those by domestic consumers. On contracts, mills are quoting 9c. at mill, but on small current orders, prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—The new demand is reported heavy, but output of nuts and bolts is being materially cut down by the shortage in the supply of steel and labor. The embargo on foreign shipments will release some products that were going abroad. All makers of nuts and bolts are back in deliveries at least 8 to 10 weeks. Discounts as adopted on April 12 last, which give prices to the larger trade in carloads and larger lots, and over which advances are charged for small lots, are given on page 166.

Rivets.—The new demand is only fairly heavy, most large consumers being covered over the remainder of this year, and some of the domestic trade is reported holding back placing orders until the Government's attitude on prices is more definitely known.

Prices on structural rivets for delivery up to Oct. 1 only are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent off for cash in 10 days.

Wrought Pipe.—Some heavy Government orders for iron and steel pipe are being placed, and others are likely to come out in a short time. The sub-committee on tubular products recently placed an order for 400,000 ft. of 6-in. steel pipe to be used in laying water lines for cantonments for National Guard encampments. It is understood this heavy order was distributed among seven or eight of the leading steel pipe mills, and that it was all furnished to the Government within about 10 days from the time the order was distributed. This committee will also shortly place about 260,000 ft. of 4-in. steel or cast-iron pipe, also to be used in laying water mains for Government cantonments. The committee would prefer to have cast-iron pipe, but may be compelled to buy steel pipe owing to scarcity of supply of the former. Other very large Government contracts for iron and steel pipe are expected to be placed with the mills in a short time, and these orders will be rolled and shipped just as soon as the mills can turn them out. The current demand for iron and steel pipe continues heavy, but mills are sold up so far ahead on lap weld pipe that very little new business can be taken, and shipped out even late this year. The mills are conserving as much of their output as they possibly can to meet Government demands. None of the mills has any lapweld pipe to spare for this year, and several of the larger mills have heavy orders on their books for 1918 delivery. The demand for butt weld pipe is fairly heavy, and some mills can promise shipment in 12 to 15 weeks from date of order. Discounts on steel pipe as adopted May 1, and on iron pipe as adopted by leading makers on July 1 are given on page 166.

Boiler Tubes.—The sub-committee on tubular products expects to place, in a very short time, contracts for many thousands of tons of steel tubes for boilers to be installed in Government boats, these orders to be distributed among the different mills. All the local makers of iron and steel tubes are furnishing thousands of feet of tubes to the Government right along, probably 25 per cent or more of the output of one leading maker going to the Government. The domestic demand for both iron and steel tubes is still abnormally heavy, but mills are sold up for months ahead, and any consumers that must have tubes fairly promptly are paying premiums of $20 to $40 per ton or more over regular prices to get them. It is said that several of the larger makers of iron and steel tubes have their output sold up for more than a year ahead, and at the same time will cheerfully furnish as much of their output to the Government promptly as it may need, shoving all other orders on their books aside. Nominal discounts on iron and steel tubes, as adopted Nov. 1, 1916, but which represent prices very much below what are actually ruling, are given on page 166.

Coke.—Last week the supply of cars in the coke regions was estimated at about 95 per cent, fully 30 per cent more than in any previous week for many months. In spite of this, prices on prompt furnace coke in the last three or four days of last week, and the first couple of days of this week did not decline more than $1 per ton. It is hinted, but so far not definitely shown, that prices on prompt furnace coke are being held up by artificial means. Coke producers say this is absolutely untrue, and claim that it is the abnormal demand for prompt blast furnace coke that is holding prices. On Monday, July 16, there were fairly heavy sales of prompt blast furnace coke of best grades at $12 per net ton, at oven. The new demand is heavy, and the higher grades of blast furnace coke are being shipped out as fast as the coke is turned out on regular orders. Several large consumers of blast furnace coke in the two valleys are paying prices ruling from day to day, and to several large pig-iron producers, this has run up costs of making Bessemer and basic iron from $9 to $12 per ton higher than in June. It is said several leading coke producers have been offered contracts by furnace interests for delivery over last half of this year at as high as $10 per net ton at oven, and have promptly turned them down, preferring to ship their coke to these consumers and take chances by fixing prices from day to day. It is the belief here among some leading coke producers that the Government may step in and fix prices on coke, and for this reason they say they do not care to make contracts. We now quote best grades of blast furnace coke for prompt shipment at $12, and 72-hour foundry at $13 per net ton at oven. Some large consumers of foundry coke are covered on contracts for last half of this year, made some time ago at $10 per net ton at oven. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville region for the week ending July 7, as 349,218 net tons,

a decrease over the previous week of 21,950 tons; this decrease was caused by the Fourth of July holiday, the men not working on that day, and most of them were off for several days.

Old Material.—The market is weak, due to almost entire absence of sales owing to uncertainty as to the Government's attitude as regards prices that may be fixed on scrap. We note a sale of 2000 tons of heavy steel melting scrap at $38, delivered, and 800 tons of low phosphorus billets and bloom ends at $55, delivered, made last week. We quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$38.00
No. 1 foundry cast	$34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio Cumberland, Md., and Franklin, Pa.	42.00 to 44.00
Hydraulic compressed sheet scrap	32.00 to 33.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	25.00 to 26.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable stock	32.00 to 33.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	52.00
Iron car axles	54.00 to 55.00
Steel car axles	56.00 to 57.00
Locomotive axles, steel	59.00 to 60.00
No. 1 busheling scrap	27.00 to 29.00
Machine-shop turnings	19.00 to 20.00
Old carwheels	36.00 to 37.00
Cast-iron borings	20.00 to 21.00
*Sheet bar crop ends	47.00 to 49.00
No. 1 railroad wrought scrap	41.00 to 42.00
Heavy steel axle turnings	26.00 to 27.00
Heavy breakable cast scrap	30.00 to 31.00

*Shipping point.

Chicago

CHICAGO, July 16.

In every direction new business is lighter, though never before have operating departments struggled so intensely to maintain an increased production. Large interests reiterate they have no steel to sell, as they have for weeks, while now both the pig iron and old material trades are dull, and the prices of the latter have slumped. The explanation of the more general quiet is that more consumers are actuated by a desire to wait and see what the Government is going to do in the matter of prices. Makers of plates and shapes are expecting at almost any moment to be called on for large tonnages to be delivered at shipyards or fabricating shops. A great question is, how rapidly will the Government want deliveries to be made? Upon this largely depends the extent to which shipments to private consumers will be deferred. As to large quantities being wanted hurriedly, there can be no question. Major General Goethals is quoted as saying that the loss of one day in the summer means a loss of two days later on. With trading so nearly stationary, prices have shown a tendency to halt in their upward progress, and many believe that the high point has been reached. In old materials only are declines shown. The leading wire interest, which has adhered to 3.20c. Pittsburgh as its base for nails and wire products, has intimated to jobbers that it considers 3.95c. a fair quotation for them to submit to their customers. Many jobbers in Chicago and other cities are accepting the advice; but some are not, and a few say that they cannot replenish their stocks at 3.20c., and that they are therefore justified in asking more than the price mentioned. The independent producers of wire products are quoting on the basis of 4c. for nails.

Pig Iron.—The market is quiet and practically featureless so far as new business is concerned. Furnaces are being urged to rush shipments, although many of the requests are based solely on the desire of consumers to get comparatively low-priced iron in their possession. With iron, as with so many other products, activity is restrained by uncertainty as to how far the Government will take a hand in fixing prices. Again, consumers are well covered for the next few months, and many buyers are taking needed vacations. Northern iron is unchanged at $55, furnace, for No. 2 foundry, basic, malleable Bessemer, etc. In Southern iron, the situation is not much changed from that of last week, except that the leading interest which temporarily withdrew deliveries in the first half of 1918 is again willing to sell that position. For delivery in the last half of this year (all offers being submitted to furnace) it probably would not consider less than $50, Birmingham, or $54, Chicago, this also being the quotation of other makers. For first half delivery of No. 2 X, it would want close to $50, Birmingham, also, while for the last half of 1918 it quotes $48. It prefers to have its 1918 contracts cover both first and last halves. Prompt No. 2 foundry has been taken at $50, Birmingham. For several hundred tons of high grade 8 per cent Southern silvery $82.75, Chicago, was paid, but silveries running high in phosphorus can be had for much less. Inquiries for charcoal iron are fewer, but prices are unchanged. Transactions in low phosphorus have been more limited. A Western producer has declined to quote on large quantities because of uncertainties attending manufacture and delivery, but he has made some sales at the equivalent of $93, f.o.b. cars, furnace. Eastern makers of copper bearing low phosphorus quote $90, furnace, or about $95, Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00 to $62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	58.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	93.00 to 95.00
Silvery, 8 per cent	82.75

Ferroalloys.—The situation is unchanged with 80 per cent ferromanganese at $400 to $450, according to delivery. A round tonnage of 10 per cent Bessemer ferrosilicon was purchased at $100, Jackson county (Ohio) furnace.

Plates.—An Ohio maker quotes 10c., Pittsburgh, on tank plates, narrow widths only, delivery this year. On wide plates—72 in. and over—it is out of the market. An Eastern mill adheres to its quotation of 10c., Pittsburgh, or 10.189c., Chicago. The large local makers are not quoting at all, but are awaiting the details of the Government shipbuilding program. They are expecting daily to hear that they will be required to furnish large quantities without delay to one or more points where the material will be fabricated, preparatory to finishing touches and assembly at some of the various shipyards which the Government will virtually commandeer. It is understood that Major General Goethals has announced that all plans are completed, including the plan of distributing work to bridge and structural shops. When the orders appear, they must be given right of way, and the needs of private consumers sidetracked, though to what degree the latter will be necessary is not yet clear. Should Lloyds specifications be insisted on, it may cause some delay, as the physical tests are severe and the limits narrow, the inspection being tedious and exacting.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Structural Material.—So far as prices go, no change can be reported. Quotations are obtainable from only one source—an Eastern mill which quotes 6.189c., Chicago, on limited lots and sizes for delivery in the next four or five months. The car business amounts to but little, the only new inquiry being for 100 composite cars wanted by the Sante Fé. Only three structural propositions were placed in the week, as follows:

Oliver Iron Mining Co., shaft sets, shuttles and bearers for "H" Pabst mine of Norrie-Aurora group of mines at Ironwood, Mich., 223 tons, to American Bridge Co.

Illinois Steel Co., structural and machine shop extensions at South Chicago, Ill., 500 tons, to American Bridge Co.

Bank of Italy, steel frame for bank building at Fresno, Cal., 300 tons, to Central Iron Works.

Jobbers quote 5c. for material out of warehouse.

Bars.—Mild steel bars continue to be quoted by an Eastern mill at 4.689c., Chicago. Rail carbon bars are

unchanged at 4.25c. to 4.50c., Chicago, and are not so active, although their use is somewhat wider. Iron bars range from 4.50c. to 5c., Chicago. None of the makers of steel bars is pressing for business. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest continues to quote the 3.20c., Pittsburgh, base, for wire nails, and jobbers, as a rule, quote 3.95c. Some of the latter, however, ask 4.45c. and over. It is an open secret that the principal producer is requesting its jobbing customers to adhere to 3.95c. on the ground that it is unfair for them to ask more of their customers in view of its adherence to the 3.20c. base. Some of the jobbers, however, assert that they have been unable to place new business at 3.20c. and are asking where they will land when their stocks bought at low prices are exhausted. They say that where they have specified justifiable quantities, they have had the amounts cut down. On the other hand, manufacturers who use wire products pronounce the course of the leading producer to be eminently fair. The independent makers quote on the basis of 4c., Pittsburgh, for nails. Their quotations to jobbers, per 100 lb., are as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Little or no business is reported. An occasional carload of rails is sold at premium prices, and as stated last week $90 to $100 has been paid for tie plates. Prices are largely nominal.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Except that makers are bending every effort to fill orders in the face of insufficient factory labor and delays in getting material, there is nothing to say. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, on page 166.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Sheets.—No. 10 blue annealed can be had in limited quantities at 8.50c. to 9c., Pittsburgh, or 8.689c. to 9.189c., Chicago, and No. 28 black at 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago. Offerings of galvanized sheets are practically nil, but they probably could be had at 10.189c. to 11.189c., Chicago. Jobbers have made no change.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Cast-Iron Pipe.—Duluth, Minn., is about to place 900 tons. The United States Government has placed 100 tons with the United States Cast Iron Pipe & Foundry Co. for delivery at Rockford, Ill., and more business of this character is expected, although considerable wooden pipe is being used. Municipal lettings are almost entirely absent. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—Consumers are showing almost no disposition to buy, and dealers, recognizing the unquestioned softness of the market, are not willing to force sales inasmuch as they can do so only by making concessions. Large consumers say they are well supplied and in a position to stay out of the market for a time. At the pace they are going, however, it will not be long before they will be seeking some grades. It is noticeable that in some of their recent purchases they wanted fairly prompt deliveries. The railroads are offering but little, evidently realizing that the market has taken a turn which makes the time an unpropitious one to sell. The Illinois Central disposed of some material, and moderate-sized lots are offered by the Santa Fé and C. & A. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$44.00 to $45.00
Relaying rails	59.50 to 60.00
Old carwheels	35.00 to 36.00
Old steel rails, rerolling	45.25 to 46.25
Old steel rails, less than 3 ft	42.00 to 44.00
Heavy melting steel scrap	32.00 to 34.00
Frogs, switches and guards, cut apart	32.00 to 34.00
Shoveling steel	30.00 to 32.00
Steel axle turnings	23.50 to 24.50

Per Net Ton

Iron angles and splice bars	$44.00 to $44.50
Iron arch bars and transoms	45.00 to 45.50
Steel angle bars	38.00 to 38.50
Iron car axles	46.00 to 47.00
Steel car axles	46.00 to 47.00
No. 1 railroad wrought	37.00 to 38.00
No. 2 railroad wrought	34.00 to 35.00
Cut forge	34.00 to 35.00
Pipes and flues	25.00 to 26.00
No. 1 busheling	27.00 to 28.00
No. 2 busheling	19.50 to 20.50
Steel knuckles and couplers	41.00 to 42.00
Steel springs	41.50 to 42.00
No. 1 boilers, cut to sheets and rings	24.50 to 25.00
Boiler punchings	34.50 to 35.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	19.00 to 19.50
Cast borings	17.50 to 18.00
No. 1 cast scrap	28.50 to 29.50
Stove plate and light cast scrap	18.50 to 19.50
Grate bars	22.00 to 23.00
Brake shoes	22.00 to 23.00
Railroad malleable	31.00 to 32.00
Agricultural malleable	26.75 to 27.75
Country mixed scrap	16.50 to 17.00

Philadelphia

PHILADELPHIA, July 16.

Uncertainty as to just what the Government intends to do with regard to price fixing has been a disturbing factor in the iron and steel trade in the past week. Both buyers and sellers are holding off and this is particularly true in virtually all of the finished lines with the exception of plates. There is not a single inquiry of any size in shapes reported here for the week, and as much as 6½c. is being asked by brokers for such shapes as they may have in stock. Announcement by General Goethals that one of the new Government shipyards would be located in Philadelphia is taken to mean that National City Bank interests, probably as represented by the New York Shipbuilding Co. of Camden, will undertake to operate the yard here. It has been the intention of the present owners of the New York Shipbuilding Co. to increase its capacity materially.

Pig Iron.—There has been little trading in pig iron during the week, the steel-making irons in particular being stagnant. Despite this lack of activity, the market in the foundry grades has been strong and prices show an advance over last week. The top in eastern Pennsylvania No. 2 X is now distinctly $55.75. Virginia No. 2 X remains unchanged at $52.50, furnace, and an offer is made here of Virginia high manganese irons in lots of 350 to 450 tons at prices ranging from $59.50 to $63.00, furnace. Basic and low phosphorus maintain their nominal quotations of last week. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, range about thus:

Eastern Penna. No. 2 X foundry	$54.50 to $55.75
Eastern Penna. No. 2 plain	54.00 to 55.25
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	52.00 to 54.00
Gray forge	51.00
Standard low phosphorus	90.00

Coke.—Conditions are considerably easier in the fuel market, and although there is talk of $15 foundry coke, that figure seems to be a little high and spot furnace coke has been down as low as $12.50 to $13 a ton.

Ferroalloys.—Ferromanganese shows no change either in demand or in price, which holds at $450 for prompt and $425 for last quarter. The feature of the week has been a considerable increase in inquiry for 50 per cent ferrosilicon.

Iron and Steel Bars.—Makers of bar iron and soft

steel bars are showing an increasing disposition to take on no additional business except for old customers. The minimum on soft steel bars is now 4½c., Pittsburgh, and a large manufacturer of bar iron is making 5c. his lowest price for contracts, with 5½c. asked on new inquiries, no matter how attractive the specifications. It is said that the new shipbuilding program is creating a heavy demand for galvanized bars as well as ship spikes.

Ore Imports.—Custom-house reports show the following receipts during June at this port: Iron ore, from Cuba, 4500 tons, valued at $22,950; iron ore, from Sweden, 17,009 tons, valued at $88,634; ferromanganese, from England, 500 tons, valued at $51,098.

Plates.—Export inquiries presented within the last few days have aggregated between 45,000 and 50,000 tons, but it is understood that no prices were quoted. Locomotive builders have been furnishing heavy specifications to the plate mills for new railroad equipment, and Government requisitions are calling for increasingly heavy tonnage. As these receive precedence, a hardship is being worked on the regular trade, for civilian orders are taken with the understanding that they must yield in all cases to Government needs. Under the circumstances, it is difficult to have an order accepted for shipment under 11 or 12 months. Quotations remain unchanged at 10c., Pittsburgh, for tank, and 12½c. for boat steel.

Sheets.—There is practically no sheet capacity available among mills of this district unless for filling Government requirements. One very small transaction which was squeezed in last week by a local maker was taken on the basis of 8¾c., Pittsburgh, for No. 10 blue annealed.

Old Materials.—The scrap market is considerably softer this week, but the unsettled feeling seems to have a background of confidence that there will be a turn for the better perhaps before the week ends. Hesitation on the part of the mills to purchase until the price-fixing situation clears is no doubt a factor. After all, the supply of old materials seems to be limited, and any fresh demand will probably mean a hardening of prices. Prices per gross ton delivered in eastern Pennsylvania territory range about thus:

No. 1 heavy melting steel	$32.00 to $33.00
Old steel rails, rerolling	45.00 to 47.00
Low phosphorus, heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old car wheels	35.00 to 38.00
No. 1 railroad wrought	48.00 to 50.00
No. 1 forge fire	25.00 to 26.00
Bundled sheets	25.00 to 26.00
No. 2 busheling	16.00 to 18.00
Machine shop turnings*	20.00 to 21.00
Cast borings*	20.00 to 21.00
No. 1 cast	35.00 to 38.00
Grate bars	22.00 to 23.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	35.00 to 36.00

*For blast furnace use.

Cleveland

CLEVELAND, July 17.

Iron Ore.—Curtailment of operations at Lake Superior mines has been necessitated by the car shortage at lower Lake ports. Boats are being delayed so long for unloading that a large amount of ore has accumulated at upper Lake ports, and in some cases the railroads have shut off on empty cars for the mines. As a result some of the steam shovels have been compelled to stop and some of the ore from underground mines is being placed on stock piles. Monday fourteen large ore boats were awaiting their turn for unloading at the Pennsylvania dock in Cleveland. The last of these will be delayed nearly five days in unloading its cargo. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market has become very quiet. There is some demand for spot foundry iron, but in view of possible price regulation by the Government consumers are withholding inquiry for iron for future delivery. Prices generally are unchanged. Foundry iron has sold at a new high price of $60 for No. 2 for a small lot for the first half delivery, although the usual Valley and Lake furnace quotations range from $55 to $58. The sale of one lot of basic iron is reported at $55. Among new inquiries is one for 2000 tons of malleable iron for the last quarter and one from the Lenoir Car Works, Washington, for 2400 tons of low phosph. iron, mostly for the first half. We note the sale of several small lots of Virginia iron at $52, furnace, for No. 2, making the delivered price in this territory lower than that quoted by most of the Northern Ohio furnaces. Southern iron is inactive. An Alabama producer has opened its books for the last half of next year and is quoting Southern iron at $48, Birmingham, for No. 2 for all of next year. The usual quotation for this year is $50. First half prices range from $45 to $50. We quote f.o.b. Cleveland, as follows:

Bessemer	$57.95 to $58.95
Basic	53.30 to 55.30
Northern No. 2 foundry	55.30 to 58.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62 to 91.62
Standard low phos., Valley furnace	88.00

Coke.—The market is weaker. There is some demand for foundry coke for prompt shipment, which is quoted at $13.50 to $14 per net ton at oven for standard Connellsville makes. Shipments are fairly good and foundries are trying to accumulate stocks. Some have been able to accumulate fair stocks recently. Furnace coke is quiet and is quoted around $12.50 for prompt shipment.

Finished Iron and Steel.—With the exception of considerable demand for plates the market in finished lines is not active, new inquiry being confined largely to small lots, some of this being from plants having Government orders. The expected regulation of prices by the Government is having an effect on the market, and buyers are withholding inquiries for steel for extended delivery. Plate mills are apparently showing no disposition to force prices higher, and the usual local quotation for tank plates is 10c., Pittsburgh, which has been the recent minimum price. Some previous quotations have been made as high as 12c. One Cleveland mill is reported to be taking plate contracts for the first half of next year at 9.50c. An inquiry from France for additional rails for portable track has been revived. If the rails could be had it is stated that 50,000 tons would be purchased, but it is expected that only about one-fourth of this tonnage will be available. A peculiar feature of the nail situation is that a leading local jobbing house securing its supply from the leading interest which is maintaining the $3.20 price is offering its stock to retailers at $3.75 per keg, while the independent mills are quoting wire nails at $4 to jobbers. As a result some jobbers are either losing business or are forced to make sales below cost. The demand for sheets continues fairly heavy. One Valley mill is offering sheets at 8.50c., Pittsburgh, for black, and 10.50c. for galvanized in narrow sizes. Other mills are asking as high as 9.25c. for black. Blue annealed sheets are quoted at 8.50c. to 9c. for No. 10. Hard steel bars are firmer, being quoted at 4.25c. to 4.50c. at mill. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates, and 9c. for blue annealed sheets.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is heavy, both in specifications on contracts and current orders. The demand for rivets is very active. Ship builders are anxious to get under contract for rivets for the remainder of the year, and are placing orders at the regular price at 5.25c., Pittsburgh, for structural rivets. Boiler rivets are maintained at 5.35c., Pittsburgh. Bolt and nut prices are unchanged, round lot buyers being allowed from 5 to 10 per cent discount from regular discounts, which are as follows:

Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is dull and weak with prices on heavy melting steel and some other grades fully $1 a ton lower than a week ago. Mills generally are refusing to buy, awaiting developments in Washington relating to price regulation. There is some activity between dealers who are covering on recent short sales and they are having no trouble in buying all the material they need. A sale of 500 tons of heavy melting steel scrap is reported to a Cleveland mill at $38, but some material offered at the same price did not find a purchaser. The sale of 400 tons of cast scrap is reported at $32, a small lot of busheling at $30 and 800 tons of borings at $20. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$38.00 to $39.00
Steel rails, rerolling	48.00 to 50.00
Steel rails, under 3 ft	46.00 to 47.00
Iron rails	48.00 to 50.00
Steel car axles	55.00 to 57.50
Heavy melting steel	38.00 to 39.00
Carwheels	37.00 to 38.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	29.00 to 31.00
Railroad malleable	41.00 to 42.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$55.00 to $60.00
Cast borings	19.50 to 20.50
Iron and steel turnings and drillings	18.50 to 19.50
No. 1 busheling	28.00 to 29.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	32.00 to 33.00
Railroad grate bars	22.50 to 23.50
Stove plate	21.00 to 22.00

Cincinnati

CINCINNATI, July 17—(*By Wire*).

Pig Iron.—The midsummer dullness has broken the record and the tonnage booked last week was probably below that of the extreme correspondingly dull periods of the past few years. The inquiry is also very much curtailed. Furnace operators in the South state that they have no iron to offer for prompt shipment and the majority of them are slow in accepting business for next year's delivery. The tendency of the melters of foundry iron is to hold off for the time being in placing orders for future delivery and just at the present moment there is hardly a ripple upon the surface. The break in scrap prices has not affected the pig-iron market and the present indifference of consumers of both pig iron and scrap does not indicate that there is any affinity between the two differently classed metals as far as prices are concerned. Spot sales have been limited to special analysis iron and contracting is at a standstill, although a few melters have lately taken the precaution to cover for a supply during the remainder of the present year. As usual in a period of this kind, odd lots of analysis iron are offered, but the total tonnage is very small and it is not having any influence on prices. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 51.90
Southern coke, No. 3 foundry	50.40 to 51.40
Southern coke, No. 4 foundry	50.00 to 51.00
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	86.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail*)

Finished Material.—Warehouse prices are unchanged and firm and business generally is said to be fairly good. Mill shipments on structural material shows some improvement. There is a growing scarcity of both black and galvanized sheets and new business is not sought by the mills, while the jobbers are taking care of what sheets they have on hand, exerting care in filling the wants of their old customers. We quote No. 28 black sheets at 8.65c., Cincinnati or Newport, Ky., and No. 28 galvanized at 10.65c., although these are merely nominal prices. The wholesale quotation on steel and iron bars is 5c. base, and twisted steel bars, 5.05c. Structural shapes are unchanged at 5.25c. and ¼-in. plates and heavier, 9½c. Cold-rolled shafting takes the list price plus 15 per cent. Rivets ½ in. and larger with round heads are quoted at 5.50c., base, and with cone heads, 5.60c. The small sized rivets in keg lots are sold at 15 per cent off list. Machine bolts ⅝ x 4 in. and smaller are unchanged at 45 per cent discount; larger and longer, 30 per cent discount. Files 50 per cent discount, and hack saw blades 10 per cent discount.

Coke.—The situation has eased up only in a slight degree as far as the supply of spot coke is concerned. However, one user of foundry coke was compelled to purchase a small tonnage last week and paid $17 per net ton at oven for it. This coke was bought from a Connellsville producer. Other sales in the same district for prompt shipment range from $14 to $16.50. Contract figures on foundry coke are around $11 to $13, but very few contracts are being made. Furnace coke is at a standstill, although a little is bought from time to time for domestic uses, and for quick shipment it brings prices very close to those asked for foundry coke. In the Wise County and Pocahontas fields, a little 72-hr. coke might be obtained for prompt shipment around $14 to $15 at oven, but New River prices are about on the same parity with those in the Connellsville district.

Old Material.—The market is in a very much disturbed condition and prices have declined in some instances as much as $5 per ton. Dealers are at a loss to account for the unsettled conditions, although some of them claim it may be due to the fear of Government regulation of prices. At any rate, there is a wide range in values as reported by different dealers and there seems to be no chance for the market to reach a sound level any time soon. Wrought scrap generally has declined more heavily than cast iron or steel. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$20.50 to $21.00
Old iron rails	35.50 to 36.00
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	39.50 to 40.00
Heavy melting steel scrap	35.00 to 35.50
Steel rails for melting	35.00 to 35.50
Old carwheels	32.00 to 32.50

Per Net Ton

No. 1 railroad wrought	$35.00 to $35.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	25.00 to 25.50
No. 1 machinery cast	25.50 to 26.00
Burnt scrap	15.00 to 15.50
Iron axles	45.00 to 45.50
Locomotive tires (smooth inside)	37.50 to 38.00
Pipes and flues	18.00 to 18.50
Malleable cast	25.00 to 25.50
Railroad tank and sheet	16.50 to 17.00

Birmingham

BIRMINGHAM, ALA., July 17—(*By Wire*).—While inclined to be conservative, Birmingham iron makers have not lowered prices for any delivery and $45 for 1918 is the lowest price obtainable. Spot remains at $50 and over. Iron for last half of 1917 is also held at $50. The leading seller of foundry iron has sold some 1918 iron at $48 and $50.

(*By Mail*)

The second week in July was a listless one, the inquiry and sales of pig iron being both at a low ebb. Optimistic consumers seem to have protected themselves, while others, hoping for price recessions due to Government process, appear content to wait. Small consumers who buy prompt iron are as hard hit as ever, there being nothing for them under $50. Car shortage causes shut-downs with some frequency, one maker last week reporting a half dozen foundries shut down for lack of metal. The week-end round-up of the makers showed the leading interest selling at $45 and $46 for first half of 1918 with $50 asked for 1917, another interest selling at $45 for 1918 and out of the 1917 market, a third, which made no sales, still on the level of $45 minimum for 1918 and $50 for 1917, the leading foundry interest quoting $52 for 1917, $50 for the first half of 1918 and $48 for the second half of 1918 with some sales made at both the 1918 figures. Charcoal remains at a minimum of $55 with very little offered.

Spot furnace sales in small lots are not selling below $50 unless for resale iron or to a preferred regular customer. Sales by brokers of prompt iron are at $50. We quote per gross ton, f.o.b. Birmingham district furnaces, for prompt delivery:

No. 1 foundry and soft	$50.50 to $51 50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars.—Steel bars in carload lots, f.o.b. Birmingham, 4.50c. to 4.75c.; iron bars, 4.20c. to 4.40c.

Cast-Iron Pipe.—The Government requirement for water pipe for army cantonments placed in Alabama plants is estimated at 25,000 tons and the sanitary pipe similarly placed at 2500 tons. Outside of this business, all of which is prompt shipment, orders have been in small lots and scattered. We quote per net ton, f.o.b. Birmingham district furnaces, as follows: 4 in., $63; 6 in. and upwards, $60, with $1 added for gas pipe and special lengths.

Coal and Coke.—Coal operators come near realizing on the maximum prices tentatively agreed upon with the Government, $3 to $4 per ton, f.o.b. mines with high grades of blacksmithing coal coming higher. The output is limited only by car shortage and indisposition of miners to work full time owing to high wages, etc. The demand for standard beehive foundry coke from the Pacific coast is stronger than ever known, some dealers report, and large contracts for as much as a year have been made on the basis of $11.50 to $12.50. Spot foundry averages around $15 with some as high as $17.

Old Material.—Scrap is depressed. A large tonnage is offering, but there is slow taking. The tremendous business done three weeks ago when the Southern scrap market went on a veritable boom is part cause of the present slump. We quote per gross ton, f.o.b. Birmingham dealers' yards, as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	30.00 to 31.50
No. 1 wrought	35.00 to 36.00
No. 1 heavy melting steel	24.00 to 25.00
No. 1 machinery cast	26.00 to 27.00
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 26.00
Stove plate and light	19.00 to 20.00
Turnings	13.00 to 14.00

St. Louis

ST. LOUIS, July 16.

Pig Iron.—Uncertainty caused by the doubt as to the Government's action in relation to prices is having its effect on the market at this point, both as to buying and selling. With a prospect of regulation of prices there is less disposition to make contracts for the distant future and as furnaces have nothing for prompt or early delivery, there is no opportunity to do business at present on any large scale at least. The melters in this territory are covered for possibly 50 per cent of their requirements for the first half of 1918, which means that there is more buying to be done whenever it becomes possible to do so with any safety as to prices. While representatives are uncertain, the furnaces seem in much the same condition, as advices from the South making $48 the price for first half have been changed to $50 and then everything withdrawn almost on the same day. On some Southern pig iron brands as high as $55, furnace, is being asked, but $48, Birmingham, is about the price for No. 2 Southern foundry for first half at present. No. 2 X, Chicago, is held at $55 and No. 2 Northern at $55 to $56 Ironton. Sales during the week totaled possibly 2000 tons, mostly for first half delivery, and a considerable number of inquiries would undoubtedly appear, if there were any prospect of doing business. One inquiry for 5000 tons of basic for export is in the market, but has not been closed, though the local furnace is figuring on it.

Coke.—Coke is a little easier in this market for the moment with spot beehive foundry grades at $14 to $16 per ton at oven for small lots. No contract coke is obtainable and furnace coke is held higher than foundry. The local by-product plant contracted during the week to deliver 10,000 tons during the coming year, beginning in August, 1917, but the price was withheld. It is understood, however, to be not far from $12 at the oven. It goes to the Aluminum company for its East St. Louis plant.

Finished Iron and Steel.—Finished products show the same state of affairs which has existed for the past several weeks, with no contracts possible and deliveries worse than ever with no prospect of improvement. The only new sale during the week was of 600 tons of 70-lb. steel rails, standard section, to a Southwestern road out of stock. The price was not given. For material out of warehouse stock, delivery being fairly good, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Old Material.—In the scrap market there has been a continuance of the uncertain conditions which have made it anybody's guess as to prices or as to what the market would do next. In consequence, there has been very little disposition to buy and none to sell while the status of old material was so indefinite. As a result of the lack of transactions, it is impossible to make quotations which can really be regarded as "the market." Rather they are estimates of values and one man's estimates are as good as another's. The railroads are not offering much of anything and they are not in possession of cars to load with scrap if they did. With the market in the noted state of dilapidation we quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$40.00 to $41.00
Old steel rails, re-rolling	42.00 to 43.00
Old steel rails, less than 3 ft	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	34.00 to 34.50
No. 1 railroad heavy melting steel scrap	38.00 to 38.50
Heavy shoveling steel	34.00 to 34.50
Ordinary shoveling steel	32.50 to 33.00
Frogs, switches and guards cut apart	38.00 to 38.50
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	23.00 to 23.50
Per Net Ton	
Iron angle bars	$37.00 to $38.00
Steel angle bars	37.50 to 38.50
Iron car axles	51.00 to 52.00
Steel car axles	49.00 to 49.50
Wrought arch bars and transoms	41.50 to 42.00
No. 1 railroad wrought	36.50 to 37.00
No. 2 railroad wrought	34.00 to 34.50
Railroad springs	32.50 to 33.00
Steel couplers and knuckles	41.00 to 41.50
Locomotive tires, smooth inside, 42 in. and over	46.00 to 46.50
No. 1 dealers forge	32.00 to 33.00
Cast iron borings	18.50 to 19.00
No. 1 busheling	28.00 to 28.50
No. 1 boilers cut to sheets and rings	20.50 to 21.00
No. 1 railroad cast scrap	25.50 to 26.00
Stove plate and light cast scrap	19.00 to 19.50
Railroad malleable	29.00 to 29.50
Agricultural malleable	24.00 to 24.50
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap	20.00 to 20.50
Railroad grate bars	18.50 to 19.00
Machine shop turnings	19.00 to 19.50
Country mixed scrap	17.00 to 18.00

San Francisco

SAN FRANCISCO, July 10.

The extraordinary situation existing in this market has been further accentuated by the Presidential embargo, made public July 9. Representatives of Eastern mills and exporters are awaiting eagerly the interpretation of the license clause, and that relating to structural steel. It would be impossible to make deliveries from Eastern mills to the Orient on orders via San Francisco within 60 days. The specific intentions of the President will, no doubt, be fully expressed shortly, and the exporters' doubts dissipated. Opinion is sharply divided here as to the influence exercised on the prices of steel products by the embargo on exports, but representatives of the large Eastern corporations are of the opinion that the tremendous domestic demand will not admit of any slump in prices, nor, indeed, of any very material reduction. However, the uncertainty over the outcome bears heavily on this market, and some of the Eastern mills' representatives decline to make quotations for the present. The railroads have been forced by circumstances to come into the market for new equipment, and their demands are heavy and insistent. A

light railroad of 12 miles is planned for the great army cantonment to be constructed at Palo Alto, some 25 miles south of San Francisco. Both Army and Navy departments are hampered in their building and repair work by the lack of material, in some instances having to accept quotations previously refused. Export orders from the West coast of South America and Japan have been arriving very freely of late, but in the present unsettled condition of affairs relating to the steel market generally they cannot be filled satisfactorily.

Bars.—Due either to the deficiency in supplies of bars or the abnormal prices, builders of concrete structures are using, in many buildings, reinforced concrete lintels and beams, which they find a fair substitute. Local mills are quoting merchant bars on a basis of 4.25c. for carload lots. Jobbers' quotations are, for steel rounds and squares, a base price of 6c.; for flats, ¼ to 1 in. thick and 1 to 6 in. wide, 6c.; under 1 in. wide, 7c.; over 1 in. thick, 7c. Refined iron bars are quoted at 5.90c. There is more than a normal inquiry for twisted steel bars, which jobbers are ready to furnish in stock lengths at a base price of 6c.

Structural Material.—The demand for structural material, other than that used in shipbuilding, is brisk from the interior of California, where a good deal of public improvement and private construction is in progress. Many who have been holding back on account of war conditions are again in the market and eager for supplies. The War and Navy departments of the United States Government will use considerable material in the erection of cantonments and other buildings. Structural shapes are being quoted at a base price of 6c. f.o.b. mill, but very little is available for immediate use.

Plates.—The demand for ship plates is immense and increasing. Three new shipbuilding yards are in the process of equipment on the Oakland and Alameda shores of San Francisco Bay. Orders from Japan are arriving by every mail, but exporters hesitate to fill these until the intent of the 60 days' export license of the President's embargo proclamation has been interpreted. Independent mills quote as follows: Lloyds hull plates, on a base of 12c. f.o.b. mill; tank plates, 11c. f.o.b. mill, though one mill quotes tank plates on a base of 10.75c. f.o.b. cars, Pacific Coast points, for export, for October, November and December delivery.

Sheets.—The same cry for sheets is heard to-day as in the closing days of last month, and it is becoming increasingly difficult to satisfy customers. In many instances the mills have to refuse new business and content themselves with doling out sufficient stock to carry their old customers. Jobbers quote an advanced base price of 12.74c. on 26-gage flat, but in view of the strong market are not inclined to render firm quotations on other lines.

Wrought Pipe.—Government needs for pipe are extremely hard to satisfy, and this leaves private concerns and municipalities with scarcely enough wrought pipe to complete work already begun. Jobbers will give no guarantee as to delivery except for stock sizes. Anticipating some relaxation of the rigid attitude of the Federal authorities toward further oil development, oil producers are planning boring more wells to supply the market, which is in a perilous situation owing to the depletion of reserve stocks required to satisfy the actual necessities of power plants and transportation companies. Inquiries for oil pipe are, therefore, on the increase.

Cast Iron Pipe.—The only buyers in this market at the present time are water companies and a few private concerns. The City of Sacramento has awarded a contract for 690 tons of water mains in 6 and 8-in. sizes at a price of $70 delivered. The present base price of 6-in. pipe or larger as quoted by Eastern representatives here is $60; for 4-in. pipe, $63.

Pig Iron.—Some concerns here which had made contracts up to the end of the present fiscal year considered themselves fortunate in having their needs taken care of, but since the embargo has been promulgated they are feeling anxious lest a decline in the price of pig iron should follow. Quotations are not readily established. Some orders have been taken at $49 to $50 per ton, f.o.b. Birmingham.

Coke.—Foundries are being supplied on orders given six months or more ago; and so barren is the coke market here that concerns which contracted for coke to June, 1918, are considered fortunate. Most holders have sold up to their capacity, and refuse to book further orders. Latest prices paid by foundries range from $28 to $30 per ton for Missouri coke. Some coke of lower grade is arriving from Puget Sound.

Old Material.—The market is almost bare of heavy melting scrap, and future conditions look serious. All scrap available for export has been sent to Japan. Good heavy scrap is selling for $25 to $28 per ton, while light scrap readily sells at $18 to $22, these prices having been paid by foundries within the last few days. One reason for the dearth of scrap in this market may be found in the fact that, during the last six months of 1916, 5680 tons were exported to the Orient, and in the first four months of 1917, 2228 tons were shipped in the same direction.

Buffalo

BUFFALO, July 16.

Pig Iron.—The market is not as active, from the buyer's standpoint, as for a week or so past. Inquiry keeps up, but orders are very light—not exceeding 3000 tons for the week—because furnaces have very little iron to dispose of. Only about 25 per cent of the inquiry received is being quoted on owing to lack of sufficient untaken output. Furnaces, as a rule, are not desirous of quoting on extended future commitments. Practically all of 1917 and a considerable proportion of first half 1918 product is already taken up. The inquiry for 15,000 tons of pig iron from a large electric interest which has been before the market recently has not yet been placed, in whole or in part, in this market, so far as can be learned. Charcoal iron for this year's delivery is also very scarce. Prices have varied but slightly from last week's quotations, but such changes as are noted show an upward trend notwithstanding the drop in the price of coke. As reported last week, there is only a narrow margin of unsold 1917 iron remaining in the market, and such small tonnages as are obtainable have a price range of $55 to $58 per ton at furnace, according to grade. For first quarter and first half of 1918, we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 3 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The waiting policy which has been one of the features of the market for the past couple of weeks as regards bars, shapes and plates, is still in evidence, with occasional inquiries for structural material and plates from ship-building companies. Large inquiry for sheets is noted and prices are firmly held at 8½c. for blue annealed, 9c. for black and 10½c. for galvanized. Wrought pipe is also in strong demand, but scarce. Standard railroad spikes advanced further during the week, and on small tonnage orders for immediate shipment 5¼c. to 5½c. is easily obtained, as mills are well sold up. The Hennessey-Mann Co., Buffalo, has the contract for fabricating and erecting steel for the North Division Street transformer station for the International Railway Co., Buffalo, about 100 tons, and bids are soon to be taken for steel for the transformer station for the International Railway Co. at Hertel Avenue and Military Road, Buffalo, requiring a similar amount. The Lackawanna Bridge Co., Buffalo, has received the contract for additional work on plant extension for the Union Carbide Co., Niagara Falls, requiring about 200 tons of structural steel.

Old Material.—The market is quiet, with very little buying movement under way at the present time, and no short sales are being made. Embargoes at one of

the large consuming points in the Pittsburgh district have been a means of diverting scrap shipments to other points, with a tendency toward a weakening in prices. This fact, coupled with the general lull in buying usual to the mid-summer weeks, has caused prices to sag somewhat for many commodities on the list, but there is no surplus of scrap material available, and on this account prices are not likely to go much lower during this period of rest in the market. A new buying movement, due when final action by the Government results in placing orders for war requirements, may, it is thought, again send prices to a higher level. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$36.00 to $38.00
Low phosphorus	50.00 to 55.00
No. 1 railroad wrought	48.00 to 50.00
No. 1 railroad and machinery cast	32.00 to 33.00
Iron axles	55.00 to 60.00
Steel axles	55.00 to 60.00
Car wheels	37.00 to 38.00
Railroad malleable	33.00 to 35.00
Machine shop turnings	20.00 to 21.00
Heavy axle turnings	28.00 to 29.00
Clean cut borings	21.00 to 22.00
Iron rails	45.00 to 46.00
Locomotive grate bars	22.00 to 23.00
Stove plate	22.00 to 23.00
Wrought pipe	33.00 to 34.00
No. 1 busheling scrap	33.00 to 34.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	22.00 to 23.00

British Steel Market

Pig Iron and Tin Plates Firm—Ferromanganese Strong—American Wire Rods High

(*By Cable*)

LONDON, ENGLAND, July 17.

The pig-iron market is generally firm with a heavy demand for hematite iron. Cleveland basic iron has been officially fixed at 97s. 6d. For American wire rods £28 has been paid c.i.f., third quarter, with parcels afloat quoted as worth £30. Tin plates are firm and sellers are scarce. Ferromanganese is strong and nominally unchanged. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 35s. 6d.

Black sheets, £21 5s.

Ferromanganese, £45 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward

New York

NEW YORK, July 17.

Pig Iron.—The dullness in the pig-iron market noticed last week is more pronounced this week, and rumors of resale iron being offered are current. Virginia sellers have disposed of limited tonnages at $52.50, furnace, for this year and at $50 and higher prices for the first half of next year. Some sales of No. 2 X eastern Pennsylvania iron have been made at $55.75, tidewater, for this year and $53.75 for next year. The only sale of any considerable tonnage announced is 2000 tons of low phosphorus to the American Locomotive Co. for the last half of this year at a price not announced. The inquiry for 500 tons per month for the last quarter of this year and the first half of next year of high silicon iron for export, has not been satisfied, as the firm having the inquiry has not been able to buy the iron. New inquiries for 5000 tons of foundry and 5000 tons of basic for export have appeared. We quote, tidewater, for prompt delivery as follows:

No. 1 foundry	$54.25 to $56.25
No. 2 X	53.75 to 55.75
No. 2 plain	53.25 to 55.25
Southern No. 1 foundry	54.75
Southern No. 2 foundry and soft	54.25

Structural Material.—The market is a little more active, with more inquiries and contract lettings than in some time, but Government work continues to predominate. One indication of the extent to which present conditions have interfered with the bookings of new orders is afforded by the June report of the Bridge Builders and Structural Society, which shows that only 47½ per cent of the capacity of the bridge and structural shops of the country was contracted for in that month. This is estimated to mean contracts amounting to 85,800 tons, which compares with 99,300 tons in June, 1916. It is the smallest total in any month since July, 1916, when the estimated total was 81,800 tons. New Government projects on which bids have been asked are the following: 600 tons for a key bridge over the Potomac River; 400 tons for remodeling four buildings at the Rock Island Arsenal; 280 tons for two coal handling bridges at the Norfolk and League Island navy yards, respectively; 140 tons for a garage and stable at the League Island navy yard. Other inquiries outside of Government work are: The Boston Elevated Railroads wants 400 tons for delivery Sept. 10; the Buffalo Union Furnace Co., 320 tons for an ore handling bridge and the Pennsylvania Railroad, 300 to 400 tons for several small bridges. The most recent Government contracts embrace the following: The American Bridge Co. has taken 270 tons for seven small magazine buildings at Fort Mifflin, and it is reported that the remainder of the forty odd buildings have been taken by the McClintic-Marshall Co. and other fabricators; the Virginia Bridge Co. has taken 600 tons for the erection shop at the Washington Navy Yard and Bethlehem sections will be used; for the 1000 tons for the hangers at Pensacola, Fla., the McClintic-Marshall Co. will furnish 840 tons and the Richmond Steel Co. 150 tons; the low bidder for the 2400 tons for the new projectile plant at Charleston, W. Va., is Warren Moore & Co., of Philadelphia, but no award has been made; the Staten Island Shipbuilding Co. has awarded 200 tons for a small building, but the 600 tons for a new machine shop has not been settled. Industrial contracts of a general nature recently awarded are as follows: The American Bridge Co. has taken 400 tons for pier sheds in Brooklyn for Post & McCord, 1167 tons for a conveying gallery for the New York Northern Central Railroad and 500 tons for the Lawrence Street subway station, Brooklyn; the Ferguson Steel & Iron Co. has taken 125 tons for an engine house and signal tower at its Gardenville yards; the Derber Engineering Co. has taken 1000 tons for an office building at Twelfth and Chestnut Streets, Philadelphia; the Belmont Iron Works has taken 1200 tons for plant extension of the New Jersey Zinc Co. at Palmerton, Pa., and the Pennsylvania Railroad has awarded 600 to 700 tons to the Phoenix Bridge Co. and other fabricators for small bridges. It is reported that the low bidder on the second call for bids for the 2500 tons for the Philadelphia public library is John Gill & Sons of Cleveland, Ohio. An unofficial statement is to the effect that no award will be made for the 3800 tons for the Culver Line in Brooklyn for the Public Service Commission on which the American Bridge Co. was the only bidder. We quote plain material from mill at 4.669c. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5.25c. per pound, New York.

Plates—Because of the uncertainty over the outcome of the price-fixing investigation of the Federal Trade Commission and the lack of a settlement of the ship controversy, the domestic plate market is in a waiting attitude. Domestic business is of a hand-to-mouth character, but demand for export, especially to Japan, continues strong and prices for export are higher than a week ago. The uncertainty which existed as to how far the mills would be affected by Government control of exports has largely been dispelled, and a new crop of export inquiries has come out. China and Italy are in the market for finished steel, as well as Japan, whose requirements of plates and shapes are said to total very large tonnages. The Japanese Commission which is now reported to be on its way to this country, will, it is said, ask our Government to permit unrestricted shipment of ship plates and shapes to Japan. At present, considerable tonnages which were ready for shipment on July 15, when the export embargo went into effect, are awaiting acceptance by the railroads, which decline to undertake their transportation until the Exports Council at Washington has granted licenses. It is evident that our shipping program will not

absorb more than 50 per cent of the output of the plate mills, hence the mills are now opening their books more freely for contracts with deliveries at their own convenience. Five thousand tons of ship plates were sold for export at 11.50c., but the quotations more often heard are 12c. and 12.50c., though relatively small lots of ship plates are being sold, as these are being reserved for our own Government. Tank plates for export have been sold at 10.50c. and 11c. One concern is said to have refused a firm offer of 10.50c., and later accepted 11c. Some of the mills are not quoting, but will consider offers from buyers. It is still possible to obtain tank plates, particularly re-sale lots, at 10c., but this price is fast disappearing. However, many are inclined to believe that the top of the wave has been reached so far as prices are concerned. Contracts for cars have been recently placed, but it is probable that further business will await the outcome of the price-fixing investigation. The Union Railroad has ordered 1500 70-ton hopper cars for the H. C. Frick Coke Co. from the Ralston Steel Car Co. The Pennsylvania Railroad is building 2225 cars at its Altoona, Pa., shops. The Erie Railroad is having 500 cars, gondola and box, repaired by the American Car & Foundry Co. The National Steel Car Co. will build 1000 steel cars for the Canadian Government. The South Buffalo Railroad has 300 steel hopper cars under negotiation. On mill shipments of universal and tank plates the price is 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store are 9c. to 10c., New York.

Iron and Steel Bars.—Mills are showing more of an inclination to quote on steel bars for shipment at mill convenience, the price on such contracts being about 4.50c., while on prompt delivery 5c. to 5.50c. is asked. The bar iron market is stronger, and 4.75c., Pittsburgh, represents about the minimum at which sales are now being made, while 5c., Pittsburgh, is more often quoted. Sales at 4.75c. are for fourth-quarter delivery. We quote steel bars in mill shipments at 4.669c. to 5.669c., New York, and bar iron at 4.919c. to 5.169c., New York. From New York district warehouses steel bars are sold at 5.25c. and bar iron at 4.75c. to 5c.

Ferromanganese.—Further submarine sinkings are reported of vessels containing ferromanganese. In the last 30 days three ships, the Haverford, the Sylvanian and the Dromore, have been reported as sunk and each one of these had consignments of ferromanganese to various representatives in this country. It is estimated that with the 1000 tons reported lost early in June with the sinking of the Southland, the total alloy that has gone down is somewhere between 2000 and 2200 tons, most if not all of it in June. When the receipt of every ton is so important to the American steel industry at the present time, the loss of such a tonnage is serious. Indications are that receipts in June will exceed in spite of this the total in May of a little over 2000 tons, but it will probably fall considerably short of the 6000 tons per month necessary to maintain the supplies estimated as necessary for the steel industry each month. Quotations for the domestic alloy seem more clearly defined this week than for some little time. While demand is not active and while sales are few, quotations are generally $400 for early delivery, $375 for the last quarter and $350 for the first half of next year, makers' works. A sale is reported of 300 tons for early delivery at $400. The British alloy is extremely scarce and most makers are sold as far ahead as July 1, 1918, with bookings probably up to the limit of their ability to deliver. A sale of one carload of British ferromanganese for shipment in November is recorded at $400, seaboard. Spiegeleisen, 20 per cent, is quiet at $85, furnace, for delivery this year. A sale of 600 tons of 50 per cent ferrosilicon at $130 per ton for delivery in the first half of 1918 is reported. The market is quiet, with the quotation for delivery this year at about $200 to $225, delivered.

Old Material.—The downward trend of the scrap market has become more pronounced during the past few days and nearly all kinds of material are depressed. This is particularly true of heavy melting steel and No. 1 railroad wrought. There is very little activity and brokers report that they can buy scrap at almost any price they care to name. Embargoes exist in several important centers and the car supply is unsatisfactory. Uncertainty as to government attitude concerning prices is given as the principal reason for the present depression. Brokers quote buying prices as follows to local producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$30.00 to $32.00
Old steel rails (short lengths) or equivalent heavy steel scrap	31.00 to 33.00
Relaying rails	65.00 to 70.00
Rerolling rails	45.00 to 46.00
Iron and steel car axles	46.00 to 48.00
No. 1 railroad wrought	45.00 to 50.00
Wrought-iron track scrap	42.00 to 43.00
No. 1 yard wrought long	38.00 to 40.00
Light iron	10.00 to 12.00
Cast borings (clean)	18.00 to 20.00
Machine-shop turnings	18.00 to 20.00
Mixed borings and turnings	17.50 to 18.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	33.00 to 33.50

The weakness which was marked last week in steel and wrought iron has extended to a degree in cast iron, but the foundry market is holding up fairly well. There is a large amount of stove plate being offered. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	34.00 to 35.00
Malleable cast (railroad)	35.00 to 36.00

Cast-Iron Pipe.—The only municipal business placed during the past week was a contract for 125 tons for Yonkers, N. Y., placed with the Warren Foundry & Machine Co. The placing of orders by private buyers is fairly active. Carload lots of 6 in., 8 in. and heavier are quoted at $65.50 per net ton, tidewater, and 4 in., $58.60.

British Output of Crude and Finished Steel in 1916

LONDON, ENGLAND, July 17. (*By Cable.*)

Great Britain's production of finished and semi-finished steel in 1916, according to reports of the Iron and Steel Federation, was as follows: Blooms, etc., 1,945,000 gross tons; sheet bars, 1,272,000 tons; rails, 271,000 tons; plates over ⅛ in. thick, 1,153,000 tons; under ⅛ in., 78,000 tons; angles, etc., 757,000 tons; beams or girders, 346,000 tons; galvanized sheets, 132,000 tons; tin plates, 577,000 tons; and puddled bars, 960,000 tons. The output of electric ingots was 31,000 tons and of electric castings 18,000 tons; all other castings, 189,000 tons.

[The totals for pig-iron and steel output of Great Britain were published in THE IRON AGE, April 12, 1917.]

German Steel Prices

At the meeting of the German Steel Works Union on June 6, the selling prices of semi-finished steel were advanced by 50m. per ton for July delivery and by 60m. per ton for delivery in August and September, according to the London *Ironmonger*. The price of shapes was raised by 10m. per ton. These advances also apply to contracts which have not yet been executed and which will have to be carried over into the next quarter. The prices of basic Bessemer bar iron have been advanced by 30m. per ton for July and by 40m. per ton for August-September delivery. The prices of basic Bessemer rolled wire are advanced by 40m. per ton for July and by 50m. per ton for August and September. Drawn wire, nail wire, and wire nails are advanced from July 1 by 30m. per ton, and thick sheets by 30m. per ton for July and by 40m. for August-September.

Employees of the International Nickel Co., Bayonne, N. J., recently on strike, returned to work on July 10 at the same wage schedule as heretofore.

IRON AND INDUSTRIAL STOCKS

United States Steel Most Active Stock in a Very Irregular Week

Steel common was the most active list on the stock market last week and ended the week with a net decline of nearly four points. The market in general moved backward and forward and evidently was affected to a considerable extent by war developments in Europe. The Government crop report for July 1 promised a handsome increase over previous estimates of the grain crop. The condition of all crops was reported a little more than 2 per cent below the 10-year average as compared with 5.18 per cent below average reported June 1. The market was given something akin to a chill by the President's expression of views as to the duties of business men concerning prices and further developments in the price-fixing program are awaited with keen interest.

Among the industrial stocks that registered gains during the past week were the following: Allis-Chalmers, ¼; American Locomotive, 1; Crucible Steel, 5¼; International Harvester, 1¾; United States Steel Preferred, ⅝. Among the stocks that made losses during the week were the following: American Can, 1; American Car & Foundry, ½; American Steel Foundries, 2; Baldwin Locomotive, 2⅛; Bethlehem Steel, 15½; Bethlehem Steel, Class B, 8½; Colorado Fuel & Iron, ¾; Gulf States Steel, 1; Lackawanna Steel, 3½; Midvale Steel, 2⅝; National Enameling & Stamping, ¾; Pressed Steel Car, 1; Republic Iron & Steel, 1½; United States Steel, 3⅞.

The range of prices in active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28¾- 31¾	Int. Har. Corp., pref.	102½
Allis-Chal., pref.	83½	Lacka. Steel	89¼- 94⅝
Am. Can, com...	47¾- 51⅛	Lake Sup. Corp..	18¼- 19½
Am. Can, pref....	106 -107	Lima Loco.	56
Am. Car & Fdry., com.	74¾- 78¼	Midvale Steel....	57¾- 62¼
Am. Car & Fdry., pref.	114¾-115	Nat.-Acme	34 - 35¾
Am. Loco., com..	69¾- 73¼	Nat. En. & Stm., com.	39⅝- 43
Am. Loco., pref..	103 -103½	Nat. En. & Stm., pref.	99½- 99¾
Am. Rad., com.	280	N. Y. Air Brake..	130 -135
Am. Ship, com...	83 - 85¼	Nova Scotia Steel	94
Am. Ship, pref...	93½- 94	Pitts. Steel, pref.	100¼
Am. Steel Fdries.	66 - 70¾	Pressed Stl., com.	71 - 75¼
Bald. Loco., com.	66¾- 72⅝	Pressed Stl., pref.	102
Beth. Steel, com..	125 -133	Ry. Steel Spring, com.	49 - 53½
Beth. Steel, class B	122⅛-134¾	Republic, com...	85⅛- 92⅛
Beth. Steel, pref.	120	Sloss, com.	52½- 58
Carbon Stl., com.	94 - 95	Sloss, pref.	95
Case (J. I.), pref.	80¼	Superior Steel...	43½- 48½
Central Fdry., com.	35 - 35¾	Sup. Steel, 1st pref.	102 - 102½
Charcoal Iron, com.	8¾- 8⅞	Transue-Williams.	43 - 44
Colo. Fuel	47½- 52¼	Un. Alloy Steel..	42⅞- 44¼
Cruc. Steel, com.	77¾- 87	U. S. Pipe, com..	21⅝- 22¾
Cruc. Steel, pref.	102½-103	U. S. Steel, com..	119¾-128¼
Deere & Co., pref.	100	U. S. Steel, pref..	117⅞-118⅝
Gen. Electric	156⅝-159¾	Va. I. C. & Coke.	65 - 66
Gt. No. Ore, Cert.	32 - 34⅜	Warwick	9
Gulf S. Steel....	117 -124	Westing. Elec....	49⅛- 50⅞
Int. Har. Corp., com.	69½- 70		

Lackawanna Steel Company's Earnings

The earnings of the Lackawanna Steel Co. in the quarter ended June 30 made a remarkable record, amounting to $7,879,412, compared with $6,203,233 in the preceding quarter and $4,051,033 for the same period in 1916. In the first half of the present year, the net earnings amounted to $14,082,644, an increase of $6,784,018 compared with 1916. After all deductions, the profit for the first half amounted to $12,198,215. In a report just issued, it is stated that provision has been made for all taxes payable under laws now in effect, but not for taxes which may be payable as a result of legislation now pending. The unfilled orders July 1 were 913,196 gross tons, a decrease of 19,661 tons compared with the close of the first half of 1916.

Republic Iron & Steel Co. Earnings Increase

The statement of earnings just issued by the Republic Iron & Steel Co., covering operations in the three months ended June 30, last, showed net profits applicable to dividends of $7,130,406, compared with $5,573,778 in the first quarter of the year. The surplus after payment of $845,365 in quarterly dividends on the preferred and common stocks was $6,285,041, compared with $3,501,561 in the first quarter of the year.

Like most of the other steel companies, the Republic's unfilled tonnage fell off in the second quarter, the total of unfilled business on hand on June 30 amounting to 528,976 tons, compared with 593,018 tons at the close of the first quarter.

The following table shows the company's net profits by months applicable to dividends, compared with the corresponding periods of 1916:

	1917	1916
April	$1,950,637.11	$1,053,025.52
May	2,720,918.62	1,234,411.35
June	2,458,850.87	1,341,198.08
Totals	$7,130,406.60	$3,628,634.95

Industrial Finances

The Canadian Car & Foundry Co., Montreal, Que., annual meeting will be held July 31. It is stated that the financial results from the completion of the Russian order will show profits, exclusive of salvage and amounts now in litigation, of over $3,000,000. It is believed that as much as $500,000 will ultimately be realized as profits on salvage from the Kingsland fire, besides which a large number of shells will be recovered which will add considerably to the $500,000. In addition, the company has now pending lawsuits for the recovery of moneys advanced, approximately $700,000. The company may follow the precedent established by many other industrial concerns and conserve its resources for the purpose of handling the large amount of business now on hand, amounting to between $15,000,000 and $18,000,000. As this requires a considerable amount of capital outlay, the directors will likely postpone the payment of the accrued dividends, and in all probability will commence the payment of the regular quarterly disbursements by the end of the calendar year.

The Crucible Steel Co. of America, Pittsburgh, has retired all but $500,000 of first mortgage, 5 per cent bonds of the Crucible Coal Co., and it is expected the remainder will be retired in a short time. The principle and interest on these bonds were guaranteed by the Crucible Steel Co. of America.

The Canadian Furnace Co., Port Colborne, Ont., has increased its capital stock from $500,000 to $1,500,000 by the issue of 10,000 shares of new stock at $100 a share.

The Mark Mfg. Co. has filed for record a trust deed to its property at Evanston, Indiana Harbor, and Zanesville, Ohio, to secure a bond issue of $6,000,000. The funds are to be used in the construction of the company's new steel plant at East Chicago, Ill.

The Crucible Steel Co. of America declared a 2 per cent dividend on the preferred stock at its regular monthly meeting July 16, thereby disposing of the accumulated dividend on the preferred, and placing the common stock in line for dividends. The regular quarterly meeting of the company will be held August 16.

The Trumbull Steel Co., Warren, Ohio, has issued $2,000,000 of preferred stock and $325,000 of common, subscription rights to which terminate July 25, with all preferred warrants accruing to common shareholders. Under new Ohio statute, common subscriptions must be paid in full by Oct. 1, and preferred subscriptions in four equal installments, Oct. 1, 1917, Jan. 1, April 1, and July 1, 1918.

Dividends

The Dominion Steel Corporation, quarterly, 1½ per cent on the preferred, payable Aug. 1.

The Taylor-Wharton Iron & Steel Co., quarterly, 1¾ per cent on the preferred, payable Aug. 1.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5.00 base; ⅜ in., 7/16 in. and ½ in., $7.50 to $8. Boat spikes are about 6.50c. to 7c., all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. Track bolts with square nuts 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails; 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage base, $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices and National Tube, which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	¼ and ⅛	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and five and one-half points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.50
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
July	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
11	30.50	30.50	63.00	11.00	10.75	9.12½	8.87½
12	30.00	30.00	63.00	10.87½	10.75	9.12½	8.87½
13	29.50	29.50	62.00	10.75	10.62½	9.12½	8.87½
14	28.50	28.50	....	10.75	10.62½	9.00	8.75
16	27.50	27.50	62.00	10.50	10.37½	9.00	8.75
17	26.50	26.50	62.50	10.50	10.37½	8.87½	8.62½

NEW YORK, July 18.

The markets are all difficult to gage. Prices are mostly nominal and business meagre. Increased uncertainty as to the Government's policy has nearly demoralized the metals. Copper has decidedly fallen. Tin is steady. Lead is weaker. Spelter is lower. Antimony is soft.

New York

Copper.—The President's statement on Friday, advocating a one-price-to-all policy for all purchases of steel, metals, etc., added more uncertainty to an already chaotic condition and since then the market, which had a tendency to be weak, has developed pronounced softness. Another unsettling factor was the statement that for the 60,000,000 lb. purchased recently by the Government at a tentative price of 25c. per lb. only 75 per cent, or 18.75c. per lb., would be paid with the settlement of any possible balance left to further investigation. The opinion is freely expressed in the trade that the Government will not pay as high as 20c. per lb. for this or any other purchases in the future. If this is to apply to the Allies and to regular consumers, the effect on the copper market as a whole is readily appreciated. A most important consideration in this connection is the fact that large numbers of consumers are under contract for millions of pounds of copper for delivery this year and into 1918 at around 25c. per lb. Under such conditions buyers are holding back and prices are more or less nominal. It is distinctly a buyers' market and one dealer expresses the opinion that almost any inquiry, sufficiently attractive, would probably receive favorable consideration from producers at almost any figure. Yesterday the quotation for both Lake and electrolytic was nominal at 26.50c., New York, for early delivery, a decline of over 4c. per lb. since a week ago. Quotations for last quarter vary, some placing it at 25c. to 25.50c. and some as low as 24.50c. per lb. Lower prices for all positions are to be expected. The London market remains unchanged at £142 for spot electrolytic and £138 for futures.

Tin.—Because tin is not as subject to Government control as other metals the market has behaved well and has been steady. It is not unlikely, however, that it will ultimately suffer if the present uncertain industrial conditions prevail. Though steady, the market is unsettled, due largely to the events of the past week at Washington. As a whole it is a narrow one, ranging in the past week between 62c. and 63c., with the quotation yesterday at 62.50c., New York, for spot Straits. Late last week a fair amount of business was quietly done in futures and early this week there was a moderate business for the same position with some spot demand in evidence but not large. Stocks of Straits tin have improved somewhat due to more liberal arrivals, which up to July 17 inclusive were 1975 tons, with the quantity afloat 3729 tons. Banca tin yesterday was quoted at 59.50c., New York. The quotation for spot Straits tin in London yesterday was £239 10s., a decline of nearly £8 since last week.

Lead.—Practically the same conditions govern the lead market which have been outlined as controlling the copper situation. With purchases already by the Government at 8c. per lb. and with the prospect of a one-price-for-all basis for all other purchases, it is not surprising that buyers are extremely cautious in committing themselves for only necessary needs in a market quoted nearly 3c. above the Government purchase. Considerable weakness has developed and the tendency is toward lower levels, with the future hazy and uncertain. On small buying and little demand the market has fallen daily in the past week until the quotation yesterday was 10.37½c., St. Louis, or 10.50c., New York. The sale of a carload was reported at 10.37½c., New York. The American Smelting & Refining Co. continues to quote 11c., New York.

Spelter.—Business is nearly paralyzed as a result of the uncertainty regarding the Government price situation. Buyers refuse to come into the market except where necessary, and the few sales that have been made have gone at varying prices. As one dealer puts it, "the market is all over the lot." It is stated that one lot of 100 tons of prime Western was sold in the past week at 8.62½c., St. Louis, for early delivery, while another sale is reported at 9c., St. Louis, also early shipment. The market is probably not far from 8.75c., St. Louis, or 9c., New York, for prime Western for early delivery, with no inclination by producers to sell for future delivery under present chaotic conditions. It is certain, however, that whatever the result of price fixing, the final prices cannot be lower than present quotations.

Antimony.—Stagnation as a result of poor demand characterizes this market. Quotations for Chinese and Japanese grades are 16c. to 16.50c., New York, duty paid.

Aluminum.—For No. 1 virgin metal, 98 to 99 per cent pure, 57c. to 58c. is the quotation, but the market is quiet.

Old Metals.—The market is very unsettled. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	28.50 to 29.50
Copper, heavy and wire	28.00 to 28.50
Copper, light and bottoms	25.50 to 26.50
Brass, heavy	19.50 to 19.75
Brass, light	14.25 to 14.75
Heavy machine composition	26.00 to 26.50
No. 1 yellow rod brass turnings	18.25
No. 1 red brass or composition turnings	21.00 to 22.00
Lead, heavy	9.25 to 9.75
Lead, tea	8.00
Zinc	6.75

Chicago

CHICAGO, July 16.—The entire market has been flat, a situation which local dealers attribute to a decision on the part of consumers to await the outcome of the proposal that the Government fix prices. Some sellers are inclined to be bitter over the state of affairs. Almost without an exception metal quotations are lower. We quote as follows: Casting copper, 28.50c.; Lake, 29.75c.; electrolytic, 29.25c.; tin, carloads, 62.50c.; small lots, 65c. to 66c.; lead, 10.75c.; spelter, 8.62½c. to 8.75c.; sheet zinc, 19c.; Oriental antimony, 18c. to 20c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23.50c.; copper clips, 23c.; copper bottoms, 21.50c.; red brass, 21.50c.; yellow brass, 15c.; lead pipe, 9c.; zinc, 6.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

ST. LOUIS, July 16.—Non-ferrous metals have been rather quiet during the week, closing to-day, for carload lots at 10c. to 10.50c. for lead and spelter at 8.87½c. In less than carload lots the prices were: Lead, 11.50c.; spelter, 10c.; tin, 66c.; lake copper, 32c.; electrolytic copper, 31.50c.; Asiatic antimony, 20c. In the Joplin district lead eased off during the week in the ore sales the top price being $115 per ton basis of 80 per cent metal. Some of the producers are continuing to hold their ore for better prices. The average for the week in the district was $111 per ton. Zinc blende was easy but held its top price at $75 per ton ranging down to $65 per ton basic of 60 per cent metal, with an average for the district of $69 per ton. In calamine the range was $35 to $42 per ton, basis of 40 per cent metal, with the average for the district $37 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12c.; heavy yellow brass, 15c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 23.50c.; tin foil, 42c.; pewter, 25c.; lead, 7c.; tea lead, 6c.; zinc, 6½c.

NEW TRADE PUBLICATIONS

Band Wheel Grinding Machine.—W. C. Barnhart, 700 Westlake Street, North, Seattle, Wash. Circular. Relates to a grinding machine for metal band wheels and pulleys which was illustrated in THE IRON AGE Feb. 1, 1917. The special advantages claimed for the machine are that the wheels can be faced without removing them and the frictional contact with the face of the band wheel drives the abrasive wheel, thus doing away with any special driving equipment. A number of views showing the machine in use are included.

Mercury Vapor Lamps.—Cooper Hewitt Electric Co., Eighth and Grand Streets, Hoboken, N. J. Bulletin No. 78. Mentions the use of mercury vapor lamps and their accessories for photographic purposes. The various kinds of photography for which the lamps are suited are mentioned with brief statements of the advantages of the lamps for each particular kind of work. The several outfits that can be supplied are illustrated and briefly described, condensed specification and price tables being included.

Photomicrographic Apparatus.—Sauveur & Boylston, Cambridge, Mass. Circular MIV. Describes a line of photomicrographic apparatus including a metallurgical microscope, an inverted metalloscope and an aspheric condenser. All of the apparatus is illustrated and brief specification tables serve to supplement the text description. Mention is made of gas and electric illuminating outfits that can be supplied.

Steel Castings.—American Steel Foundries, McCormick Building, Chicago. Calendar hanger measuring 12½ x 27¾ in. Each leaf of the calendar is divided into four sections. The one at the top contains a reproduction of a drawing symbolizing some stage in the process of making steel castings from the mining of the ore to the finished product, while the remaining three have the dates for the past, present and next months respectively, the figures for the present month being printed in heavier type, while the size is practically the same for all three.

Tool Grinding Machine.—Gisholt Machine Co., Madison, Wis. Circular. Presents a brief statement of the advantages to be derived from the installation of one or more tool grinding machines in a central location in charge of a boy or handy man, instead of having the operators leave their machines and grind their own tools. Among the advantages claimed for this arrangement are that the idle time of machines is eliminated, correct grinding of tools is secured, and the investment in tool steel is reduced. A partial list of users is included.

Air Compressors.—Chicago Pneumatic Tool Co., Fisher Building, Chicago. Bulletin No. 34-Y. Covers a line of air compressors that are driven by gas and gasoline engines. Longitudinal sections showing the details of construction of the two compressors are presented with the various parts marked. Specification tables of the compressors, which can be supplied in the stationary type, tank mounted, or on skids for semi-portable use, are given, together with illustrations of the three types. The construction of the compressors is gone into at some length, the text being supplemented by numerous views of various parts.

Oil Engines.—McEwen Bros., Wellsville, N .Y. Catalog. Concerned with a horizontal four-cycle type high compression engine, operating on the Diesel principle and adapted to burn any kind of heavy crude oil or residue. The construction of the engine is gone into at some length, the text being supplemented by views of the several parts and the results of a series of fuel consumption tests and indicator diagrams are included.

Internal Grinding Machine.—Lansing Stamping & Tool Co., Lansing, Mich. Bulletin No. 3. Relates to a machine for the internal grinding of small pieces such as automobile parts, ball races, bushings, cam rollers, universal balls and many other types of work. One of the special claims made for the machine is rapidity and accuracy of production, the grinding wheel spindle revolving at from 15,000 to 30,000 r.p.m. and turning out work that is correct within 0.001 in. Illustrations of the machine itself and of installations in manufacturing plants supplement the text description and a condensed table of specifications is included. An illustrated description of the grinding machine appeared in THE IRON AGE, Feb. 1, 1917.

Steel Hardening.—Stroh Steel Hardening Process Co., 728 Monadnock Block, Chicago. Catalog. Size, 9 x 12 in.; pages, 24. Contains a brief account of the theory of the Stroh process of hardening steel castings, which is a method for casting alloy steels together with ordinary soft steel in a single, solid piece, the depth, location and hardness of the alloy being completely controlled and varied according to the size of the piece and the nature of service expected. Illustrations of various products made by this process, such as rolling mill gears and pinions, crusher rolls and heads, mine car wheels, grinding pans and track work, are presented with brief descriptions of the service that these parts were called upon to perform. A brief historical account of the development of wheels and illustrations and descriptions of the two plants of the company are included.

Electric Hoists.—Lidgerwood Mfg. Co., 96 Liberty Street, New York. Bulletin No. 20. Shows a complete line of electric hoists that have been developed especially for general contracting work as well as a few of the many types that have been designed and built for special hoisting duty. A brief general description of the construction of the hoists is presented and this is followed by illustrations, descriptions and tables of sizes of the different hoists. In practically every case a single page is given to each type, the illustration being at the top and the table of sizes at the bottom with the descriptive matter coming between.

Photo Engraving Machinery.—John Royle & Sons, Paterson, N. J. Circular No. 288. Describes briefly and illustrates a line of photo engraving machinery which includes saws of the column, cabinet and jig types, routing and beveling machines and a combination jig sawing and drilling machine. Mention is made of the various types of routing cutters that can be supplied for use, and reference is made to a complete booklet covering this line of machinery.

Payroll Machinery.—International Money Machine Co., Reading, Pa. Pamphlet. Illustrates a line of payroll machinery which includes mechanism for making change automatically and adding, listing, recording, payroll scheduling and money paying machines. A brief general description of the way in which the machines operate in conjunction with each other precedes brief descriptions of the machines themselves. A partial list of users and a number of testimonial letters are included.

Motor Vehicle Governors.—Monarch Governor Co., Detroit. Pamphlet. Pertains to a governor for automatically controlling the speed of motor vehicles which utilizes the rate at which the gases are drawn into the cylinder to operate the control member of the governor. Among the features upon which special emphasis is laid are the absence of any connection to any moving part of the engine or vehicle, elimination of all revolving parts and driving gears and shafts, automatic and instantaneous action with change in the load on the engine and ability to lock the governor at any desired speed. The construction of the governor is gone into at some length and instructions for its installation are presented, together with a dimension table and diagram.

Torsion Meter.—Cummings Ship Instrument Works, Boston. Pamphlet. Calls attention to the Gary-Cummings torsion meter which is designed to furnish an easy means of obtaining a record of the amount of horsepower transmitted by a propeller shaft. The construction of the meter is gone into at some length and the text is supplemented by numerous illustrations. Instructions on the care and operation of the meter are presented and a reproduction of a shaft calibration data sheet is included.

Grinding and Polishing Machinery.—Gardner Machine Co., Beloit, Wis. Catalog. Size, 6½ x 10 in.; pages, 121. Devoted to a line of grinding and polishing machinery and the various accessories and supplies employed in connection with them. The machines include disk and ring wheel types, band finishing machines and polishing and buffing lathes. Instructions on the use of abrasive disks are given, followed by illustrations, brief descriptions and condensed specification tables of the various machines. In practically every case a separate page is given to each machine. The plain and ball bearing spindles used with the machines are described at some length. Among the accessories listed are wheel presses, tables of various types, ring wheel chucks, wheel dressers, etc.

Tool Steels.—Colonial Steel Co., Pittsburgh. Catalog No. 16. Gives general description and specifications for a line of tool, alloy and special steels with methods of treatment, lists of extras and other useful information. Various steps in the process of manufacture are shown, as well as articles made from the different steels.

Threading Die and Holder.—Greenfield Tap & Die Corporation, Greenfield, Mass. Pamphlet. Contains an illustrated description of the Acorn type of threading die which has been recently developed by the company. Tables of the sizes manufactured are included and mention is made of the various other products of the corporation which include screw cutting tools, gages, reamers, lathes, pipe tools and threading, grinding, cutting-off and screw machines.

Boiler Preservative.—Boiler-Kote Co., 343 South Dearborn Street, Chicago. Pamphlet. Contains a short treatise on the use of a preparation called Boiler-Kote for the prevention of scale and corrosion in steam boilers. It is a mineral solution which is introduced into the feed lines. The sheets, flues and tubes are coated with a fine glaze to which the scale does not adhere and the preparation is also claimed to remove any scale that may have formed.

PERSONAL

Col. John Campbell Maben, chairman of the board of the Sloss-Sheffield Steel & Iron Co., who is living at the Waldorf-Astoria hotel, New York, is seriously ill. A general breakdown is the cause. His condition showed improvement this week.

W. J. Hughes, who for a number of years has been connected with the Schoellkopf Aniline & Chemical Works, Inc., Buffalo, and other Schoellkopf interests in that city, as general purchasing agent, has become general purchasing agent of the National Aniline & Chemical Co., with which the first named company has been merged, and will have his headquarters in New York City. Mr. Hughes was tendered a farewell banquet at the Statler Hotel, Buffalo, by his associates and representative business men of the city last week.

C. W. Oliver has resigned as general sales agent of the Virgina Iron, Coal & Coke Co., Roanoke, Va., to accept another position.

John N. Willys, of the Willys-Overland Co., Toledo, Ohio, has been formally elected president of the Curtiss Aeroplane & Motors Corporation of Buffalo. He succeeds Glen H. Curtiss, who has been elected chairman of the board. William A. Morgan, president of the Buffalo Copper & Brass Rolling Mill, Buffalo, has been elected a director to succeed George Palmer, resigned, and was also elected vice-president and general manager in charge of all operations. Mr. Willys was made a member of the executive committee, succeeding Harry Evers of Buffalo.

The International Oxygen Co. announces the appointment of R. M. Klein as sales manager, with headquarters at the company's main office, 115 Broadway, New York. Mr. Klein has been an engineer in United States Government employ, sales manager for the Diehl Mfg. Co., and manufacturers' representative handling a number of mechanical lines.

F. H. Tackaberry, general agent of the American Steel Export Co., sailed from New York July 7 for South America. He will cover a large portion of the Latin-American countries, visiting Rio de Janeiro, Sao Paulo, Buenos Aires, Montevideo, La Plata, Rosario, Valparaiso and Santiago, to collaborate with the company's various agents and to study market conditions in iron and steel, engineering and contracting.

J. H. McKelvey has been appointed sales manager of the Laclede-Christy Clay Products Co., St. Louis, succeeding H. K. Lackland, resigned.

Charles A. Paquet has resigned as president of the General Car & Machinery Works, Ltd., Montmagny, Que., to become the general managwer. Mr. Paquet succeeds W. E. Patterson, who has asked to be relieved on account of ill health. D. O. Lesperance, a director of the company, was unanimously elected president. The plant is operating to capacity, working day and night, and employs over 900 men.

Frank R. Bacon, president Cutler-Hammer Mfg. Co., Milwaukee, electric controlling devices, has been called into the federal commissary service as a captain in the quartermaster officers' reserve corps and left July 10 for Philadelphia.

P. L. Williams has become superintendent at the works of the Empire Steel & Iron Co., Mt. Hope, N. J., succeeding H. M. Roche, who has become superintendent of the Wharton Steel Co., Dover.

Frank Lynch, superintendent of the Peerless Tube Co., Locust Avenue, Bloomfield, N. J., has joined the government service in the Aviation Corps.

The Walter A. Zelnicker Supply Co. and affiliated companies are now represented in the Birmingham district by Thomas A. Hamilton, who for the past 14 years has been connected with Crane Co., prior to which he was superintendent of the East St. Louis plant of the Zelnicker Car Works. Mr. Hamilton will have charge of both buying and selling in the southeastern territory. His office will be at 1018 Woodward Bldg., Birmingham, Ala.

Russell Wykoff, who has been connected with the Detroit office of the United Alloy Steel Corporation, Canton, Ohio, has been appointed district sales agent at Chicago, succeeding Barton L. Little.

Harry A. McKnight has resigned as superintendent of the plant of the American Car & Foundry Co., Jeffersonville, Ind., to enter the operating department of the Canadian Car & Foundry Co. He is succeeded at Jeffersonville by Charles T. Hertzsch, assistant superintendent of the plant.

W. S. Jones, at present connected with the department of the general manager of sales of the Midvale Steel Co., has been elected to the vice-presidency of the Vanadium Alloys Steel Co., Pittsburgh and Latrobe, Pa.

C. P. Perin, New York, has returned from a trip of several weeks to Great Britain.

S. H. Chauvenet, formerly connected with the Robesonia and Sheridan blast furnaces in the Lebanon Valley, will be manager of the Island Park furnace, Easton, Pa., recently purchased by the Northern Ore Co. from the Thomas Iron Co.

James A. Parker, who has been connected for some years with the United States Steel Products Co., New York, has been appointed by Secretary Redfield as steel expert for the newly created Division of Export Licenses of the Bureau of Foreign and Domestic Commerce. Mr. Parker will assist in scrutinizing and passing upon applications for licenses to export those forms of iron and steel covered by the President's recent proclamation.

W. A. Bliss has become treasurer of the Kidd Drawn Steel Co., Aliquippa, Pa., and will take an active part in its affairs. For the past 10 years, he has been secretary, treasurer and general manager of the Keystone Sand & Supply Co., a subsidiary of the Dravo Contracting Co.

Anketell M. Henderson, manager Commonwealth Steel Products, Ltd., Melbourne, Australia, accompanied by A. Goninan, managing director of that company as well as of Goninan & Co., Newcastle, spent several days in the Milwaukee machinery field during the past week. Messrs. Henderson and Goninan left Sydney on May 10, coming to the United States by way of Hawaii and Vancouver. They are especially interested in machinery for the manufacture of axles and wheels for railroad cars, which they are to manufacture for the British government in Australia.

C. H. Hobbs has been appointed Detroit district sales manager of the Lackawanna Steel Co., succeeding Jay C. McLauchlan who represented both this company and Pickands, Mather & Co., in Detroit. Mr. McLauchlan is now associated with Pickands, Mather & Co. in Cleveland, and this firm is represented in Detroit by H. E. Blackwell as district sales manager.

H. Kirke Porter, president of the H. K. Porter Co., Pittsburgh, builders of light locomotives, has offered Oak Manor, a large estate in the East End, Pittsburgh, as a convalescent hospital for wounded soldiers. The home will be turned into a hospital and fully equipped by Mr. Porter, and will be in charge of the Red Cross.

Frank R. Frost, formerly assistant to the president of the Pittsburgh-Hickson Co., Butler, Pa., has resigned, and is now connected with the sales department of the Superior Steel Corporation, Union Arcade Building, Pittsburgh.

The Jones & Laughlin Steel Co., Pittsburgh, has retired from the market as an active manufacturer of chain. The chain department of this concern is located at its Soho Works in Pittsburgh, and the ground it occupies is needed, and must be used for the 128-in. plate mill being installed by this company, which it bought some months ago from the Algoma Steel Co. The work of installing this plate mill is going on rapidly, and it is expected to be ready for operation by Oct. 1 or possibly before. Contracts for chain now on the books of the Jones & Laughlin Steel Co. will be taken care of, and shipments made as promptly as possible.

THE BURNING OF FUEL OIL*

Some Details of Its Use Under Stationary Boilers to Produce Steam

OIL from which the lighter constituents have been distilled off will probably be the liquid fuel most used. This is due to the rapid increase in the use of gasoline in motor vehicles and of distillates in stationary engines, as well as the improvements in refining crude oil. Fuel oil may be classified according to the flash point, viscosity, specific gravity, heat value and sulphur content, all of which characteristics are more or less dependent upon each other.

The flash point is of interest from the standpoint of safety, especially on shipboard where inflammable vapors are apt to accumulate in the hull or to be freed in a closed boiler room, due to leaky piping. The viscosity is the principal consideration in the actual burning of the oil, since the success of the burner or atomizer depends largely on its ability to atomize the fuel into sufficiently fine particles to insure satisfactory combustion. Assuming that the equivalent evaporation from and at 212 deg. is 8 lb. and 14.5 lb. for coal and oil respectively, a ton of coal is equivalent in practical heating value to 3.34 bbl. of oil weighing 325 lb. each and having a heating value of 19,500 B.t.u. per lb. Aside from the cost oil has numerous other advantages over coal. Among these are less storage space for an equal number of heat units, absence of ashes, less help for firing, reduction of wear and tear on the furnace and repairs to grate bars, steam can be raised quickly with no loss due to banking fires and in case of an emergency the fire can be instantly extinguished.

The first consideration for reliability in the operation of an oil burning installation is the oil supply to the burners involving a storage tank, pumping outfit and heaters. The size of a storage tank varies, of course, with that of the boiler plant, but it should at least be large enough to hold carload of oil. As the insurance requirements call for the tank to be below the level of the pumps and the burners, it is usually buried in the ground and should preferably be not less than 50 ft. from the nearest building.

The oil pumps are the next consideration and the best results have been secured from a duplex steam pump of the piston pattern type with brass valves, metallic packing in the oil piston, special gaskets and piston rod packing. An air chamber should be fitted on the discharge side to steady its pulsations of pressure and a governor on the steam end to maintain a constant pressure. Strainers on the suction side should be provided to keep trash from getting under the pump valves. The pump should be set as near the level of the oil as possible to give minimum suction lift and the suction pipe should be as straight as possible, bends being preferred to elbows. Where the suction pipe is long a foot valve, preferably a horizontal swing check valve used in a vertical position, at the bottom of the suction line in the tank is recommended. A relief valve, set at a pressure heavier than the working one to minimize the danger of breaking the pump, is also desirable.

Heating in the suction tank is necessary to enable the pump to lift the heavier oils. Practically all of the oil now burned as fuel requires heating to reduce its viscosity and facilitate atomization at the burner. The principal considerations of a heater for this work are ample heating surface and the utilization of all of it. In heating oil with a steam coil in a vessel of oil there is a tendency to have the oil next to the coils very warm, but this heat is not readily transmitted to the adjacent oil. For that reason, a heater in which the oil is kept in rapid motion over all the heating surface of the oil will give the best results, and in one type the oil is sent at high velocity through a long coil of brass pipe heated by steam on the outside. Several pumping sets consisting of duplicate pumps with pressure governor, air chamber, gage, suction strainers on pumps, relief valve and heater, all combined in a single self-contained unit, are on the market at the present time.

In an installation where the burners are shut down for any length of time, a by-pass should be provided to enable the oil header to be filled with heated oil before the burners are lighted. The type of burner which has proved best for land installations is the steam atomizer burner with oil supplied to it under pressure. The burners may be of either the round-flame or flat-flame type, the latter being preferred as it uses less steam for atomizing and produces a flame of such shape as to permit proper mixture of air to support combustion without excess air. The general type of flat-flame burner is a tip in which the oil flows out of a horizontal slot in a fan shape and falls on a fan-shaped jet of steam issuing from a lower parallel slot. The position of the burner depends largely upon the type of boiler, the burner being set in the firing door where there is a long unobstructed furnace and at the back shooting toward the front of the boiler where the furnace is short and the gases travel upward. Steam and oil connections should be made to allow for expansion and contraction of the oil and the steam headers, unions being provided above and below the burner to enable the latter to be taken out quickly for cleaning. A steam connection should be provided on each burner for blowing out the oil when the burner is shut down, as otherwise the oil will carbonize due to the heat radiated from the hot furnace.

*From a paper recently presented by B. S. Nelson, at a joint meeting of the Louisiana Association of Members of the American Society of Civil Engineers and the New Orleans Section of the American Society of Mechanical Engineers. The author is an engineer with A. M. Lockett & Co., Ltd., engineers and contractors, New Orleans, La.

Hearings on War-Deficiency Appropriations

WASHINGTON, July 17.—The House Committee on Appropriations has begun hearings on a so-called war deficiency appropriation bill, which it is planned to pass at the present session. This bill will carry nearly $2,000,000,000, of which probably more than one-half will be used in the purchase and manufacture of big guns, ammunition and equipment for the second draft of men, which it is expected will be made within the next 12 months. The money for these appropriations will be obtained partly from the increased revenue to be produced by the pending war revenue act and partly from the new bond issue which will be floated some time after Oct. 1, next, and which is estimated at two or three billion dollars.

The Bath Iron Works, Bath, Me., a shipbuilding plant, has been sold by the estate of John S. Hyde, principal owner and for many years president of the company, who died last March, to a syndicate of Maine bankers who will develop the property. Ex-Governor William T. Cobb is president of the new corporation, which has contracts for building nine torpedo boat destroyers.

The Brier Hill Steel Co., Youngstown, Ohio, is adding two hot sheet mills to the plant formerly operated by the Western Reserve Steel Co., which it bought several months ago, and has also added a new warehouse. Directors of the Brier Hill Steel Co. leave on Saturday evening, July 21, for an inspection of the ore properties of the company in the Northwest.

The National Tube Co., Frick Building, Pittsburgh, has received a Government order for 8,000,000 ft. of bedstead tubing, to be used in the manufacture of beds for the cantonments and National Guard encampments. The company received this order about three weeks ago, and it will be completely filled and shipped by July 20, or very shortly after that date.

The new model town of McDonald, to be established by the Carnegie Steel Co., west of Youngstown, Ohio, will be connected by trolley lines with both Youngstown and Niles by a line to be built along the south side of the Mahoning River, it being extended to the present line of the Mahoning & Shenango Railway & Light Co.

About 700 employees at the machine shop of the New York Shipbuilding Co., Camden, N. J., and 5000 employees from other departments, held a flag raising at the machine works on July 11. This was the thirtieth flag raising event which has been held at the shipyards.

Pittsburgh and Nearby Districts

The Sotter Brass Foundry Co., South Eighteenth and Mary Streets, Pittsburgh, has recently been organized, and is prepared to furnish all kinds of brass, bronze and aluminum castings, also different grades of babbitt metal. C. J. Slotter is general manager.

The Jones & Laughlin Steel Co., Pittsburgh, has recently bought a large piece of ground adjacent to its Southside works in that city, which will likely be used for future extensions, plans for which have not been made.

Plans are still under way by the Sharon Steel Hoop Co., Sharon, Pa., for extensions to the plant of the Youngstown Iron & Steel Co. at Youngstown, Ohio, which it took over some months ago. It is probable two or three open-hearth furnaces will be added to the plant, besides extensions to be made to the finishing mills. Definite plans about these will probably be completed in a short time.

J. G. Hershey, for several years with Max Solomon, dealer in iron and steel scrap, Oliver Bldg., Pittsburgh, has resigned, and with an associate has formed the Acme Tube Co., for the purpose of handling, as jobbers, lap weld iron and steel and seamless steel boiler tubes, also mechanical tubing of all kinds. The new company has a warehouse in Pittsburgh, where it will keep tubes in stock, and will have facilities of cutting to lengths. It will sell direct to consumers in all parts of the country, not being restricted to any particular district. The company also represents the Elyria Iron & Steel Co., Cleveland, in Pennsylvania.

E. M. Herr, president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, strongly denies that his company is seeking skilled mechanics to be interned in the works for 10 months, while making secret munitions for the United States Government. The following notice was posted in all the plants of the company in East Pittsburgh last week:

"The statement published in several newspapers to the effect that this company is to isolate certain employees for a period for the purpose of manufacturing secret war munitions is absolutely without foundation of fact. A. Taylor, manager of works."

The Federal Radiator Co., New Castle, Pa., is said to have received an order for 150 hot radiator heaters for the United States Government. These are to be delivered within 45 days from date of order, and are for use in the cantonment camps which are being built by the Government for the mobilization of the conscript troops.

The American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, has started some of the new double hot tin mills, which it is adding to its Shenango works at New Castle, Pa., and also to its Farrell works at Farrell, Pa. Ten of these double hot tin mills are being added to each plant, and it is expected that all of them will be ready for operation within a short time. It is believed that these double mills will turn out as much tin plate as two single mills. The company is also employing more female labor in its different sheet and tin plate mills than ever before, owing to the difficulty in getting men. The company is building 100 or more houses for its employees at its Farrell works.

The Diamond Forging & Mfg. Co., manufacturer of forges, stampings and galvanized iron and steel products, is now occupying its new plant on the Northside, Pittsburgh, which has been under construction for some months. The plant is located on the main line of the Pennsylvania Lines West, with which it has direct switch connection, and can also ship over the Baltimore & Ohio Railroad. In the new plant the company has more than doubled its galvanizing department and all the equipment in the galvanizing, forging and stamping departments is driven by individual electric motors, and overhead cranes and trolleys command the entire plant. The company has added a stamping department, which will have a capacity of 60 tons per day. New presses, designed for rapid and economic work, have been installed. The stamping department will specialize in pole line hardware. In addition, the company will manufacture a complete line of light forgings. The officers of the company are W. D. Henry, president; G. Wickersham, vice-president and general manager; D. M. Smith, secretary and sales manager, and Clarke Painter, treasurer.

The machine shops and foundry of the Thomas Carlin's Sons Co. of the Northside, Pittsburgh, were sold last week by public auction to the Modern Machinery Exchange and the Manhattan Machinery Exchange, both of New York City, for $120,000. Plans of the purchasers are not known, but it is believed the plants will be wrecked and the machinery sold in the open market.

The Howard Stove Co., Beaver Falls, Pa., will build an addition to its molding plant to cost $12,000, and will be in the market for some new equipment.

OBITUARY

WILLIAM G. BEE, vice-president of the Edison Storage Battery Co., and one of the pioneers in the automobile industry, died July 11 at his home, 477 Main Street, Orange, N. J., after an illness of about two years, aged 48. He was born in Hartford, Conn., and is said to have driven the first electric automobile at Newport, R. I. Mr. Bee was at one time connected with the Pope Mfg. Co., which later organized the Electric Vehicle Co., leaving the latter concern to join the Edison organization, of which he subsequently became vice-president and, until the time of his illness, sales manager.

N. L. C. KACHELMACHER, chairman of the board of directors of the Bessie Furnace Co., New Straitsville, Ohio, died at Philadelphia recently. The Bessie Furnace Co., which he organized, was taken over several years ago by the Allen S. Davison Co., of Pittsburgh. Mr. Kachelmacher was at one time president of the Hocking Coal & Iron Co., Columbus, Ohio. He was prominent in the effort to bring together several Eastern companies about two years ago, including the Thomas Iron Co., Empire Steel & Iron Co. and Wharton Steel Co.

J. C. KENNEDY, a retired veteran of the iron trade, died in Youngstown, Ohio, last week. He was born Sept. 16, 1829, in the district in which he died. After the war he entered the iron business, and became prominent in the development of the industry in the Mahoning Valley district. He operated the old Brier Hill furnace and furnaces in Struthers and Lowellville, all in the Mahoning Valley, and in the Pittsburgh and Buffalo districts. He was the uncle of Julian Kennedy, engineer of Pittsburgh.

VALENTINE NORTMANN, one of the organizers and for many years president of the Nortmann-Duffke Foundry Co., Milwaukee, retiring in 1915, died at his home in Milwaukee July 9, aged 60 years. Mr. Nortmann was born in Milwaukee Feb. 3, 1857, and established the present Nortmann-Duffke shop in 1880.

JOHN SPUCK, founder of the Spuck Iron and Foundry Co., died in St. Louis, July 15, after an illness of about three weeks. Mr. Spuck was born in Germany but settled in St. Louis in 1862. He is survived by a widow and daughter.

BENJAMIN F. COVEL, for nearly 50 years owner of the machine shop of the Covel Machine Co., Fall River, Mass., is dead at the age of 73 years. Mr. Covel was born in Fall River and had lived there all of his life.

On July 11 fire destroyed a section of the plant of the Wilmington Steel Co., Third and Herald streets, Wilmington, Del., comprising an 18-in. mill building, a repair and rigging shop and electrical department, with loss estimated at about $150,000. This company is a subsidiary of the Midvale Steel Co.

The Detroit Steel Products Co., Detroit, will open a sales office in the Union Building, Newark. This will be a sub-office under the New York office.

LIFE OF CAST-IRON PIPE*

Some Unusual Records in American Railroad Experience

SOME service records on cast iron pipe used in railroad water supply lines were recently developed which are of value to those concerned with water service installation. These data should also afford an opportunity for interesting comparisons with the basis used by the Federal valuation forces in estimating the depreciation on this material.

The long life of cast-iron pipe is a matter of rather general knowledge. There are records of pipe in use in Europe for over 200 years. In this country, and particularly on railroads, such long time service records are not to be had because of the limited time that these pipes have been in use. In the early years of American railroads, water service requirements were usually fulfilled with pipes of less than 3-in. diameter and the use of cast-iron pipe in consequence was limited to locations where 3-in. or larger pipe were used. The records which follow are secured from the few examples of cast-iron pipe lines over 50 years old available for investigation.

In the Ground 49 Years

Several instances of old installations of cast-iron pipe were recently made the subject of some study on the Illinois Central Railroad with the result that the life of several of these lines has been accurately traced down to the present time. The most interesting of these is a pipe line laid at Centralia, Ill., in 1855. This was a line of 4-in. cast-iron pipe approximately 10,000 ft. long. After 12 years of service in 1867, the pipe line became inadequate for the water consumption and upon examination it was found to be heavily encrusted. Efforts were made to improve its capacity by cleaning it and relaying a part of it with clean-out boxes at intervals of 100 ft. This provided only a temporary relief and the following year about 5000 ft. of the line was taken up and relaid with 8-in. pipe, which is still in service after being in the ground 49 years.

The 4-in. pipe relieved at Centralia was relaid in 1868 or 1869 at Ramsey, Ill., where it remained in service until 1903, when it again became too small for the demand and was replaced by 6-in. pipe. Since that time the old 4-in. pipe has been used at various places, principally as drains. A part of it is now in storage at Burnside, Ill. This pipe has a bell that differs in several details from the standard designs of the present time. Another interesting detail is the presence of two reinforcing rings or enlargements in the thickness of the pipe at the third point of the length.

A characteristic of early cast-iron pipe was an inequality in thickness, resulting from the practice of casting the pipe with the mold in a horizontal position. Measurements taken indicated an average thickness of about ⅜ in. As a means of getting some idea of the loss of section occurring during the 62 years of service, the dimensions of this pipe were compared with records of early designs of cast-iron pipe, and the conclusion was reached that it originally conformed to a design recorded in an early issue of the *Journal* of the Franklin Institute, having a length of 9 ft., diameter of 4 in., thickness of shell of 7/16 in. and depth of hub of 4 in.

Another installation of which authentic records are available is one of 7500 ft. of 4-in. cast-iron pipe at Little Wabash River, laid in 1857. This remained in service until July, 1893, when it was replaced by larger pipe. The old pipe was stored at Centralia until 1894 or 1895, when portions of it were relaid at that place and at Effingham and at Big Muddy. The installations at the last named places have since been removed but the pipe at Centralia is still in service. No signs of paint can be found on the pipe at the present time and apparently it never had been painted.

*From the *Railway Age Gazette.*

Pipe Relaid Again After 40 Years' Use

Some 6-in. cast-iron pipe laid at Centralia in 1868 and 1869 was taken up when the shops were abandoned in 1916. The pipe was found to be in such a good state of preservation after 40 years of service that most of it was reused, no distinction being made between the old pipe and the new cast-iron pipe. Other examples of long life for lines of cast-iron pipe on the Illinois Central include a 4-in. pipe line, 1740 ft. long, at Cherokee, Iowa, laid in 1870 and continued in service until 1900, when it was abandoned on account of a change in the location of water facilities; a line of 3-in. cast-iron pipe, 1175 ft. long, laid at Correctionville, Iowa, in 1887, and still in use; a line of 3-in. pipe 606 ft. long laid at Gaza, Iowa, in 1888 and abandoned in 1911 on account of the destruction of the water plant by fire; and a line of 4-in. cast-iron pipe 2962 ft. long laid at Webster City, Iowa, in 1869. A part of this pipe line is still in use.

Attention can well be called to the tendency of cast-iron pipe, in common with all types of pipe, to become more or less encrusted with lapse of time. This, however, has no bearing on the long life of such pipe, since the pipes can be cleaned from time to time. For example, the Illinois Central experienced difficulty of this kind in 1913 with an 8-in. cast-iron pipe line supplying water from the Big Muddy River at Carbondale, Ill. This pipe had been so encrusted that a pressure of 140 lb. per square inch was necessary at the pump to deliver 400 gal. per minute, which indicated that the pipe was reduced to approximately the capacity of a 5-in. pipe. Upon examination it was found that the diameter was reduced to about 7 in., indicating a large increase in the friction factor as a result of the increased roughness.

After studying the situation a contract was let for cleaning the pipe under a guarantee to restore it to 95 per cent of the discharge capacity of new pipe. The encrustations removed from the pipe were estimated to represent about 16 tons of material, and the work was done without taking the station out of service for more than a few hours at a time and with no interruption to a train service. After the cleaning was complete a test run on the pump gave a discharge of 498 gal. per minute for an average pressure of 70 lb. per square inch, the contractor having fully met with his guarantee to restore the pipe.

From the information presented it is clear that cast-iron pipe has not been in use long enough to demonstrate its actual service life. The data on loss of thickness are too limited to permit of any definite conclusions, although indicating that the ultimate life must be many times the total number of years represented in any of the records given.

Inventory of Automotive Plants

WASHINGTON, July 17.—A comprehensive industrial inventory of the automotive industries, including automobile, airplane and watercraft factories, to make available to the Government all possible information regarding the manufacturing facilities and the possibilities of expansion for war work, has been inaugurated by the Automotive Committee of the Council of National Defense. The inventory was set on foot several days ago and the first replies have already come in. The work will probably require at least three weeks. The committee states that the undertaking was inspired by the approaching great demand on the industries for airplane engines, motor trucks, tractors and motor boats for war purposes.

Alabama Iron to Chicago by Water

An experimental trip with a tow of pig iron from Sheffield, Ala., to Chicago, by way of the Chicago drainage canal, has been undertaken under direction of Capt. Swain, Peoria, Ill., with the river towboat Enterprise, which left Paducah, Ky., on Sunday, July 15. Engineers declare that the channel is sufficiently deep to accommodate barges of pig iron. If the trip is successful, it is proposed to organize a regular service.

The Readjustment of Steel Prices

Movement to See that "Raw Materials" Come Down

Results of the Conference at Washington—Prices to Be Decided by Federal Trade Commission's Cost Inquiry—Manufacturers as Government Advisers

WASHINGTON, July 17.—The leading representatives of the steel industry have promised to place at the disposal of the Government any desired amount of their products at prices to be fixed hereafter when the Federal Trade Commission shall have completed its investigation of costs of production in this and other basic industries. This agreement was reached after a series of conferences held here on July 11 and 12, the Government being represented by the Secretaries of War and Navy, the chairman of the United States Shipping Board and the chairman of the Committee on Raw Materials of the Advisory Commission of the Council of National Defense, while the spokesmen of the steel producers were the following members of a special committee appointed by the American Iron and Steel Institute: Elbert H. Gary, chairman, and James A. Farrell, president United States Steel Corporation; Charles M. Schwab, chairman, and E. G. Grace, president Bethlehem Steel Corporation; J. A. Burden, president Burden Iron Co.; E. A. S. Clarke, president Lackawanna Steel Co.; H. G. Dalton, Pickands, Mather & Co.; A. C. Dinkey, vice-president Midvale Steel & Ordnance Co.; John A. Topping, chairman Republic Iron & Steel Co.; James B. Bonner, Carnegie Steel Co., representing the above committee in the distribution of Government steel.

Official Statement on the Conference

Following the final conference, Secretary Baker, as chairman of the Council of National Defense, made the following official announcement:

> At the conference this morning between the committee of the American Iron and Steel Institute and the Secretary of War, the Secretary of the Navy, Chairman Denman of the Shipping Board and Bernard M. Baruch of the Advisory Commission of the Council of National Defense, further discussion was had of the prospective demand upon the steel industry of the country for supplies of various steel products for carrying on the war.
>
> The steel men repeated their assurances that their entire product would be available for the needs and they were doing everything possible to stimulate an increased production and speed deliveries. The price to be paid for the iron and steel products furnished was left to be determined after the inquiry by the Federal Trade Commission is completed, with the understanding that the price when fixed would insure reasonable profits and be made with reference to the needs of this vital and fundamental industry.
>
> The representatives of the Government assured the committee of the steel institute that it was the intention of the Government to distribute the war requirements over the entire iron and steel producing capacity of the country.

President on One Price for Government and Public

The closing conference of the steel men with the Government officials was held soon after the publication here of a significant address of the President to the industrial leaders of the country, urging that profits be subordinated to patriotism, and the agreement of Judge Gary and his colleagues is regarded as the pledge of the steel industry to "do its bit" in the vigorous prosecution of the great war. Among other things the President said:

> The Government is about to attempt to determine the prices at which it will ask you henceforth to furnish various supplies which are necessary for the prosecution of the war and various materials which will be needed in the industries by which the war must be sustained. * * *
>
> A just price must, of course, be paid for everything the Government buys. By a just price I mean a price which will sustain the industries concerned in a high state of efficiency, provide a living for those who conduct them, enable them to pay good wages, and make possible the expansions of their enterprises which will from time to time become necessary as the stupendous undertakings of this great war develop. We could not wisely or reasonably do less than pay such prices. They are necessary for the maintenance and development of industry; and the maintenance and development of industry are necessary for the great task we have on hand. * * *
>
> I hear it insisted that more than a just price, more than a price that will sustain our industries, must be paid; that it is necessary to pay very liberal and unusual profits in order to "stimulate" production; that nothing but pecuniary rewards will do it—rewards paid in money, not in the mere liberation of the world. I take it for granted that those who argue thus do not stop to think what that means. * * *
>
> Let me turn for a moment to the shipowners of the United States and the other ocean carriers whose example they have followed and ask them if they realize what obstacles, what almost insuperable obstacles, they have been putting in the way of the successful prosecution of this war by the ocean freight rates they have been exacting. They are doing everything that high freight charges can do to make the war a failure, to make it impossible. * * *
>
> And there is something more that we must add to our thinking. The public is now as much part of the Government as are the Army and Navy themselves. The whole people in all their activities are now mobilized and in service for the accomplishment of the Nation's task in this war; it is in such circumstances impossible justly to distinguish between industrial purchases made by the Government and industrial purchases made by the managers of individual industries; and it is just as much our duty to sustain the industries of the country, all the industries that contribute to its life, as it is to sustain our forces in the field and on the sea.
>
> We must make the prices to the public the same as the prices to the Government. Prices mean the same thing everywhere now. They mean the efficiency or the inefficiency of the nation, whether it is the Government that pays them or not.

All Prices to Be Readjusted

The agreement of the steel men embodied in Secretary Baker's announcement is not to be taken as complete acquiescence in all the propositions laid down in President Wilson's address. For example, it does not specifically include in its scope the supplying of the steel requirements of the Allies and, especially, it does not promise that the requirements of private consumers shall be put on a parity, as regards price, with those of the Government. That the steel industry, however, will be called upon to go further and supply the Allies and the private American consumers at prices far below the present market, if not at the same figures as are required by the Government, may be taken for granted.

The unlimited power of the President under the enabling legislation recently enacted by Congress opens up an extraordinary vista of possibilities; but the steel men are hopeful that if the Government undertakes to dictate prices for practically the entire output of the industry it will, in both letter and spirit, so redeem the promise of reasonable profits made by Secretary Baker as to provide a stimulus to the necessary expansion of the industry. In this the Government will consult its own interest, and the chief concern of the steel producers will be that the adjustment of all the essential details of this important matter is placed in the hands of men sufficiently familiar with the industry to secure intelligent handling.

"Raw Materials" to Be Lowered in Keeping

Significant statements following the recent conferences have been made by representatives of the Government, that the war requirements will not be imposed upon any selected concerns but will be distributed equitably throughout the industry, coupled with the statement that the Government appreciates that finished steel cannot be produced at the prices suggested by Secretary Daniels and others if "raw materials"—meaning, presumably, pig iron, etc.—"cost from $40 to $50 a ton." It was added that the Government would take steps to see that steel producers are protected in their supply of raw materials and enabled to secure them at less than current prices. In view of the fact that the leading steel makers control the bulk of their own raw materials, these statements are highly suggestive and the question arises as to how carefully they have been considered.

Although the Federal Trade Commission has informally announced that its investigation into the cost of producing steel will be completed in two or three weeks, it is understood that the Government will not delay the placing of orders until the commission's data have been received, but will proceed upon the theory that the question of price need not be determined until the bills are to be paid. No great delay in fixing the scale of prices is anticipated, however, and all the points at issue will likely be settled before any considerable deliveries under new orders are made.

Whatever uncertainties may exist regarding the fixing of prices for the requirements of the Allies and the general consuming public, the understanding is perfect that the Government shall have the first call upon the output of every producer in the industry and that, without the formality of commandeering, it may take over any material it may need, no matter in whose hands it may be found. While no definite pledges have been given in this regard, it is understood that every reasonable effort will be made by the Government not to embarrass those enterprises of the country dependent upon the iron and steel industry and that a general spirit of co-operation shall prevail.

Baruch, Rosenwald and Scott for War Board

The agreement of the steel men concerning the Government needs, which has been to some extent anticipated by the understanding heretofore secured with the coal operators, is regarded as the forerunner of others that will ultimately embrace substantially every line of production relied upon for war material. This fact emphasizes the importance of the projected reorganization of the Council of National Defense and the appointment of the proposed Purchasing Commission to do all the buying of war material for the Government. The council during the past week submitted to President Wilson a definite plan for the reorganization of its committee system and action is anticipated in the very near future. The project provides for the elimination of the great majority of the council's 150 committees and the creation of a War Industries Board of three members directly answerable to the council. While the President has given no intimation on the subject, the three men whose names are most prominently mentioned for these places are Bernard M. Baruch, chairman of the council's Committee on Raw Materials; Julius Rosenwald, chairman of the Committee on Supplies; and Frank A. Scott, chairman of the General Munitions Board.

Manufacturers and Defense Council Committees

While President Wilson is understood to disapprove the provision of the Lever bill, now under discussion in the Senate, which would prevent men prominent in the leading industries of the country from serving on the committees of the Council of National Defense, some restrictive legislation on this score is expected. Senator Chamberlain, chairman of the Committee on Military Affairs, who is in charge of the Lever bill, has signified his willingness to accept a substitute for the provision referred to in the form of the so-called Pomerene amendment, which provides as follows:

Sec. 3. No person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall solicit, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States to make any contract or to give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any agent or employee make or be a member of any committee or other body which shall make or participate in making any recommendation concerning such contract or order to any council, board, or commission of the United States, or any member or subordinate thereof, without making to the best of his knowledge and belief a full and complete disclosure in writing to such persons or group of persons of any and every pecuniary interest which he may have in such contract or order and in any party thereto, nor shall he participate in making such contract or giving said order. Any willful violation of any of the provisions of this section shall be punished by a fine of not to exceed $10,000 or by imprisonment for not more than five years, or both.

Attacks on Manufacturers Answered

The attacks heretofore made on the business men of the country, and especially upon leading men in the iron and steel industry, who have given their time to service on the committees of the Council of National Defense, are warmly resented by many prominent Senators, and a vigorous defense of the steel men was made in the Senate on Friday by Senator Newlands of Nevada, who said in part:

In an atmosphere of suspicion and distrust, not warranted by a single thing that has been presented for our attention, not warranted by a single proven charge, we propose to penalize the members of these committees of sellers and say, "You can give your information, you can give your advice, but you can not take a contract, nor can any concern in which you are interested take a contract."

What do you do, then, with reference to the steel interests? Why, you prevent these captains in the steel industry from acting on the committee at all, and you go to men of less experience and less information for that which the Government seeks.

Where is there any evidence that the Government has suffered? Do not the Council of National Defense know that they are dealing with sellers? Does not each department chief know that he is dealing with a seller? Mr. Gary is chairman of one of the subcommittees regarding steel. When the Council of National Defense ask him whether the condition of the steel industry is such as will enable the Government to receive a prompt response to a demand for 1,000 or 10,000 or 1,000,000 tons of steel, do they not know that he is an interested party, and do they not go to him simply because he is an interested party and knows and understands the industry? But you propose to penalize that man and other men like him.

To whom would you go for information with regard to the steel industry of this country in preference to Mr. Gary and Mr. Schwab? We know that these two men have all the information at their disposal. Are you going to have the Council of National Defense take mere theorists and experts and send them all over the country to make inquiry, when the information can be collected and presented to them quickly and almost instantaneously by the parties interested in the industry? And, knowing that they are interested, will they not be on their guard with reference to the price?

What do we witness today? We know that the steel industry has mobilized itself with a view to meeting the demands of the Government. They know what plants can be enlarged, how their output can be enlarged and, mind you, it will be necessary to enlarge outputs and to make large expenditures in plants. Are you going to prevent the corporations in which they are interested from having any contract with the Government? And right here today, what evidence

have you of lack of careful methods of procedure upon the part of the Council of National Defense? Have they accepted the price per ton which the Steel Trust and the other plants insist upon as a fair price, a price which they can receive elsewhere in the market Not at all. The Federal Trade Commission, under the direction of the President, is now engaged in a careful inquiry as to costs. I have gone over some of that work with members of that commission, and I can see how careful and studious their attention to that job has been. We have in the papers an illustration of the care with which the administration is proceeding in this matter—an absolute refusal upon the part of the President and upon the part of the Secretary of War and the Secretary of the Navy to accept the price which is presented by this industry as a fair price, and an indication that rather than accept that price the Government will resort to the extraordinary power, given by the law, of commandeering their plants.

Mr. President, I hope there will be some adjustment of that matter. I hope there will be some adjustment of that matter through the Federal Trade Commission after they have ascertained their costs. I trust there will be such a settlement of it as will give the steel industry a fair profit and as will also stimulate the steel industry to enlarge its plants. We all know that there must be some stimulus. If they shall enlarge the plants at the expense of tens of millions of dollars, and the war should come to an end this week or next month, or next year, those plants might be idle. So that there are two things to be considered. These men, representing the stockholders, must see to it that there is a sufficient guaranty for the future if they are to increase their capital expenditure: and the Government, on the other hand, is warranted in fixing such a price as will stimulate them to increase their plants and to produce the products that are essential for the prosecution of the war.

An agreement has been reached looking to the elimination of steel, copper, lead and other articles from those provisions of the Lever bill authorizing the President to control the production, distribution and prices of foods, fuels and other "war necessaries." A vote will be taken on this measure in the Senate on July 21.

W. L. C.

TENNESSEE CO. EXTENSIONS

Plate and Combination Shape Mills and Large Fabricating Shops

President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., has just made the following announcement at Birmingham, Ala., of the details of the new construction program of his company:

"Construction will begin at once upon a group of mills designated as the Fairfield Works of the Tennessee Coal, Iron & Railroad Co. An electrically driven, reversing blooming mill will roll slabs and blooms for two finishing mills. The finishing mills consist of an electrically driven 110-in. plate mill and an electrically driven combination mill designed to roll shapes, bars and light rails. The products of the shape and plate mills will be delivered by electrically operated telphers to large fabricating shops.

"The mills are selected to produce the products which are particularly required in connection with the conduct of the war. The location selected for the Fairfield Works is in Possum Valley, southwest of the Fairfield by-product ovens.

"The housing of the employees of the new mills will be provided for in part by the company through the construction of houses for about 600 families. The total number of houses required will be very considerably in excess of this number."

The Judson Iron Co., Oakland, Cal., has completed the first unit of its $1,000,000 steel plant. At an official try-out of the first unit, 22 tons of open-hearth steel were converted into ingots. The completed unit will have a capacity of 80 tons every 24 hours.

The Ashland Steel Co., Ashland, Ky., whose plants were closed July 1 to make general repairs and install new equipment, resumed operation July 16.

Domestic Production and Consumption of Spelter in 1916

The domestic production of spelter in the last quarter of 1916, according to data compiled by W. R. Ingalls and published in the *Engineering and Mining Journal*, was the largest ever recorded and was more than double that rate at the beginning of the war. The total was 189,572 net tons, as compared with 94,336 tons in the second quarter of 1913, the largest before the war. The output by quarters in the last four years was as follows in net tons:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1913.....	92,082	94,336	83,062	88,782
1914.....	90,224	92,816	92,756	94,516
1915.....	100,844	121,624	133,916	150,758
1916.....	156,704	167,085	169,643	189,572

Ore receipts by smelters in 1916 are given as 1,777,891 tons against 1,257,528 tons in 1915 and 872,767 tons in 1914. Importations of ore in 1916 were 384,422 tons, or nearly three times those of 1915 and about 13 times those before the war, when they were only 26,946 tons is 1914.

A classification of the domestic consumption of spelter in 1916 from returns from 170 out of 317 consumers and estimating the rest, gives the following in net tons:

Galvanizing	207,849
Sheet zinc	40,053
Brass	175,435
Castings	2,359
Desilverizing lead	5,307
Other purposes	4,351
Unclassified	14,900
	450,304

It is not claimed that these last figures are correct. The requirements for brass purposes had been estimated previously at 17,700 tons per month for the first half of 1916 and at 22,500 tons per month for the last half, or a total for the year of about 240,000 tons, as against 175,000 tons given above. If it actually happened that the spelter used by galvanizers exceeded that used by brass makers last year, then all guesses were wrong, for the needs of the brass industry had been placed at more than 50 per cent and of the galvanizers at not over 35 to 40 per cent of the total.

Will Build Rolling Mill in New Orleans

The Dixie Steel Corporation, which was recently incorporated at New Orleans, La., with $500,000 capital, has elected the following officers: President, B. W. Seidel; first vice-president, J. A. Stubbs; second vice-president, John G. Grosz; treasurer, Joseph L. Walle; secretary and auditor, G. J. Capdevielle; attorney and counsel, E. T. Florance. The company will build a rolling mill in New Orleans and will at first specialize in bar steel, but later on bolts and nuts and other small products will be manufactured. The plant is to have a capacity of 200 tons daily, though the initial output will be limited to 2200 tons a month.

Lodge & Shipley Machine Tool Co. Officers

The new organization of the Lodge & Shipley Machine Tool Co., Cincinnati, resulting from the sale by Murray Shipley of his entire interests in the business, is as follows: President, Mrs. William Lodge; vice-president and general manager, J. Wallace Carrel; secretary and treasurer, L. A. Hall. Mr. Shipley had served as vice-president since the formation of the company.

The new tin plate plant of the Bethlehem Steel Co., Sparrows Point, Md., which will be under the management of J. M. Jones, is expected to be placed in operation during the week of July 23. It is electrically operated. It will begin with 6 hot plate mills, which it is planned to increase to 24 later. About 250 men will be employed at the outset. The company has a large number of orders on hand and it is said these will keep the plant going for the entire year.

ELECTRIC STEEL PRODUCTION

Marked Increase in 1916 in All Leading Countries and Greater Promise for 1917

The extent to which electric steel is at present being made in the world, together with some data previous to the war, is given for some of the leading countries, as follows, in the order of their magnitude in 1916, and in gross tons:

	1916	1915	1913	1912
Germany	180,335*	129,000	101,755	24,177
United States	169,918	69,412	30,180	18,309
Great Britain	49,256	22,000	.....	.....
Austria-Hungary†	47,247	23,895	26,837	21,556
Canada	43,790	61	.....	.....
France	.....	.....	18,000*	15,922
Totals	490,546	244,368	176,772	129,964

*Estimated metric tons.
†Metric tons.

Last year witnessed a doubling of the output as represented by these leading countries, a remarkable achievement. Germany's production is estimated for the last two months of 1916, the official total to Nov. 1, 1916, having been 148,777 metric tons, no reports having been issued since. The doubling last year of the previous year's output by both Great Britain and Austria-Hungary and the large increase in Canada's production are noteworthy. Previous to 1915 Great Britain did not publish any statistics for electric steel and Canada was virtually a non-producer. Data regarding France have been difficult to obtain and nothing has been published about this output since the war started. In 1909 the electric steel output of France was 6456 metric tons, and in 1911 it was 13,850 tons. Sweden, Italy and Russia are producers of electric steel, but data have not been ascertainable.

The great strides made in the United States are the outstanding feature of this compilation. Starting with a production of only 18,309 tons in 1912, the output of nearly 170,000 tons last year is about five and one-half times that of 1913 and two and one-half times that of 1915, the rate of increase being decidedly greater than the splendid showing of Germany. While our output last year did not come up to the calculated production of 225,000 tons and while Germany's undoubtedly was larger, the 1917 record for this country will easily greatly exceed that of any other country. Well-informed estimates place it at close to 300,000 tons for 1917.

Maximum Prices for the British Steel Trade

The latest published maximum prices, governing the sale of British pig-iron and steel, as given by the London *Iron and Coal Trades Review* of June 15, 1917, are as follows for gross tons, except in the case of high-speed tool steel:

Maximum Prices for Pig Iron

	Per Ton Net, f.o.b. Makers' Works
Hematite pig iron, East Coast, Scotch and Welsh	£6 2s 6d
Hematite pig iron, West Coast	£6 7s 6d
Cleveland pig iron, No. 1	£4 16s 6d
Cleveland pig iron, other grades	£4 12s 6d
Common Staffordshire	£4 20s 0d

Maximum Basis Prices for Steel

	Per Ton, f.o.b. Makers' Works
Ship plates, ¼ in. and over	£11 10s 0d
Boiler plates	£12 10s 0d
Subject to extras for special thickness, sizes and qualities not exceeding those customary in district of manufacture.	
Angles, ordinary sizes	£11 2s 6d
Joists, ordinary sizes	£11 2s 6d
Rails (railroad), over 60 lb. per yard	£10 17s 6d
Sheet and tin plate bars	£10 7s 6d
Blooms and billets, ordinary mild steel	£10 7s 6d
Blooms and billets, special	£11 0s 0d
Rounds and squares, 3 to 5½ in. diameter or square (untested)	£12 10s 0d

All subject to extras for special sizes and qualities not exceeding those published in any such list as above.

Heavy steel melting scrap...£5 5s per ton deld. buyers' works
Turnings and borings.....£2 10s per ton deld. buyers' works

Maximum Price for Bar Iron

Standard quality, ordinary sizes and merchants' lengths, £13 15s per ton net, f.o.t. makers' works.

Marked bars, £15 10s per ton, less 2½ per cent, f.o.t. makers' works.

Subject to extras for special sizes and qualities not exceeding those published in any such list as above.

To the above prices for bar iron and steel a sum not exceeding 2½ per cent on such prices may be added in the case of sales by persons other than the makers.

Maximum Prices for Highspeed Tool Steel

Finished bars, 14 per cent tungsten,
2s 10d per lb. deliv. buyers' works
Finished bars, 18 per cent tungsten,
3s 10d per lb. deliv. buyers' works
(Subject to usual extras for special sizes)

Scrap:
Millings and turnings, 5d per lb. net, deliv. steel makers' works.
Bar ends, 6d per lb. net, deliv. steel makers' works.

Changes since the publication of this list in THE IRON AGE, Aug. 3, 1916, have been very few. Both grades of Cleveland pig iron have been advanced 5s., as has also common Staffordshire pig iron. Prices for old material have been reduced 5s. per ton, while marked bars have been raised 10s. per ton.

U. S. Standard Thread Recommended for Pipe

The gradual substitution of the U. S. standard thread in place of the Briggs form now generally employed for pipe has been recommended by the committee of the American Society for Testing Materials on the revision of pipe threads. The committee forms a part of a joint one on this subject with representatives of the American Gas Institute, the American Society of Mechanical Engineers, the Manufacturers' Association on Standardization of Fittings, the Master Car Builders' Association and the Railway Signal Association. The proposed change from one thread to the other is to cover a period of years, and a system of tolerances and gages which will provide for changes in them every two years will be worked out.

Acquires Detroit Furnace Company

The Detroit Iron & Steel Co., Detroit, of which M. A. Hanna & Co., Cleveland, are selling agents, has purchased the Detroit Furnace Co. The company manufactures pig iron and has a capacity of about 20,000 tons a year. Joseph C. Clutts, Wellston, Ohio, is president, and Charles F. Fraser, Detroit, is secretary and treasurer of the Detroit Furnace Co.

The International Engineering Works, Inc., Framingham, Mass., has purchased the plant and business of the International Engineering Works, Ltd., a Canadian corporation, in the United States. The new company is organized under the laws of Massachusetts, with capital stock of $500,000, and has no connection with the Canadian company. J. Philip Bird, general manager of the National Association of Manufacturers, is president; Harry V. Bady, vice-president; Frew W. Chipman, treasurer; William H. Walker, sales manager.

The large shipyard of the Sun Shipbuilding Co., at the foot of Morton Street, Chester, Pa., is nearly completed, and preparations are being made to rush the work on several Government contracts. The company has contracts for two mine-sweepers and four other vessels for the Government. It also has several other contracts. The plant covers a tract of about 50 acres. The first keel was laid about three months ago.

The San Francisco office of the Blaw-Knox Co., a consolidation of the Blaw Steel Construction Co. and the Knox Pressed & Welded Steel Co., will be maintained in the Rialto Building in charge of Edward Ornitz.

The Savage Arms Co., Savage Street, Utica, N. Y., has placed an 8-hour day in effect at its works, commencing July 16.

WILL ENLARGE PLANT

Youngstown Sheet & Tube Co. Will Add to Its By-Product Coke-Making Capacity

The Youngstown Sheet & Tube Co., which installed last year four batteries of 51 Koppers by-product ovens each, or a total of 204 acres, has placed a contract with the H. Koppers Co., Union Arcade Bldg., Pittsburgh, for two additional batteries of 51 ovens each, which will give this concern a total of 306 Koppers by-product ovens. An illustrated description of the present by-product plant was given in THE IRON AGE, issue of Dec. 7, 1916. The new 102 ovens will be of a more general design than those in the plant installed last year. The oven chambers taper from 17 in. wide at the pusher end to 19½ in. wide at the coke end, and are 9 ft. 10⅝ in. high by 39 ft. 6 in. long. The type of oven is known as the Koppers horizontal cross regenerative by-product oven. The capacity of the present 204 ovens is about 2200 to 2300 tons of coke per day on 17 hours' operation, and the new 102 ovens will increase this to about 3400 tons of coke per day. This additional output of 1000 to 1100 tons of coke per day will be used at the two Andrews & Hitchcock blast furnaces at Hubbard, Ohio, which were bought by the Youngstown Sheet & Tube Co. early last year. The company will also increase the capacity of its by-product plant for making benzol, toluol, tar and sulphite of ammonia about 50 per cent. The Barrett Co. has a contract for the entire output of tar of the present by-product plant, and will also take the increased output of tar made by the addition to the by-product plant.

The Youngstown Sheet & Tube Co. is prepared to develop rapidly 7000 to 8000 tons of coal lands of Greene County, Pa., which it bought some years ago. It is sinking a shaft and building over 100 houses for miners, and will use this coal when it is ready to be shipped to its by-product coke ovens at Youngstown. The company is also installing what is known as a double plate mill, which will roll 96 and 84-in. wide plates, the contract for which was placed several months ago with the Mesta Machine Co., Pittsburgh. Some slight changes are being made in the open hearth stock house, tracks being straightened and other minor changes made to better facilitate the handling of stock. The Youngstown Sheet & Tube Co. has opened a sales office in Room 1032, Dime Bank Bldg., Detroit, in charge of G. W. Bostwick.

Metal Trades Outing

The Cincinnati Branch, National Metal Trades Association, held its mid-summer meeting at Magnesia Springs, Ind., July 11, President A. H. Tuechter presided. After routine business had been transacted, Mr. Tuechter spoke feelingly on the retirement of Murray Shipley from the machine-tool manufacturing field. In response, Mr. Shipley tendered his sincere thanks to the members both collectively and individually for their active co-operation during the term he served as president and later simply as a fellow member. He stated that the association would at all times have his active support. Secretary J. M. Manley, who arranged the outing, was given a rising vote of thanks.

Australian Steel Shortage is Acute

Stocks of steel plates, tin plate and galvanized iron are low throughout Australia and the demand is acute, according to U. S. Commercial Attache Philip B. Kennedy of Melbourne. There is at present very little prospect of outside relief and an effort is being made to manufacture these goods in Australia. Recently representatives of a company in Newcastle and one in Melbourne were sent to the United States to purchase machinery for making steel. The high freights and shortage of supply offer a great incentive to the manufacture of lines that would have been considered impossible to produce before the war.

TAKE HILL IRON MINES

Properties Will Be Operated by M. A. Hanna & Co. of Cleveland

Most of the Hill iron ore properties on the Minnesota ranges have been taken over by M. A. Hanna & Co., Cleveland, who have been selling agents for the Hill interests for some time. The lease includes a number of operating mines, properties now under development, and some that will be developed later.

The mines now under operation that were transferred are principally those which were operated by the United States Steel Corporation before surrendering its Hill lease. These include the Harold, Leonard, Mississippi, North Uno, South Uno and Thorne properties. Other properties involved are the Fay, Wabigon, Dale and Feigh. Hanna & Co. will operate the Hill mines under a recently organized subsidiary, the Hanna Ore Mining Co., of which J. D. Ireland, who has been in charge at Duluth of the Hanna mines, will be general manager, and W. E. Hunner, formerly with the Arthur Iron Mining Co., the Hill mining organization, will be assistant general manager.

After the surrender of its lease by the Steel Corporation, new leases of some of the Hill properties were made to the Tod-Stambaugh Co., Butler Brothers, and others, and more recently to the Jones & Laughlin Steel Co. and Inland Steel Co. It is stated that the Hill interests retain only about 15 per cent of their original holdings, which are largely low grade ore.

M. A. Hanna & Co. have also taken over the Hill interests in three lake freighters that are now under construction. Much difficulty was experienced last year in obtaining vessels in which to ship the Hill ore and for that reason operations at Hill mines were greatly curtailed.

A $4,000,000 Machine Shop at Norfolk

WASHINGTON, July 17.—The Navy Department is preparing to expend approximately $30,000,000 within the next two years for the improvement of the Norfolk Navy Yard and the establishment of a new naval base on the recently acquired site of the Jamestown Exposition. Twenty millions will be spent on the Navy Yard, according to a statement made here by Rear Admiral Harris, Chief of the Bureau of Yards and Docks. Among the items to be covered by the proposed expenditures are a machine shop, designed to be the largest in America and to cost $4,000,000, with five acres of floor space; a structural shop with tools and equipment to cost $2,000,000; a mammoth power plant to cost $1,500,000; a dry dock to cost $5,500,000, and various auxiliary buildings. One million will be spent for the improvement of the water front at the present Navy Yard.

The Bureau of Yards and Docks on July 16 opened bids for the construction of the naval projectile plant at Charleston, W. Va., embracing four large buildings. Bids were received from the following contractors: C. W. McNulty Co., Charleston, W. Va.; Boyle-Robertson Construction Co., Washington, D. C.; F. W. Mark Construction Co., Philadelphia, Pa.; James Stewart & Co., Inc., New York City; R. H. Arnold Co., Washington, D. C.; Ketler-Elliott Erection Co., Chicago, Ill.; Warren Moore & Co., Philadelphia, Pa., and John W. Cooper Co., Buffalo, N. Y. Aside from the John W. Cooper Co., which presented a proposal to build the plant on a cost-plus-profit basis, all the bidding contractors presented itemized bids without totals, and as a result the experts of the Bureau of Yards and Docks will have to make a careful analysis of all the proposals before they can determine the lowest bidders or the respective aggregates of the several bids.

The cities of Bethlehem and South Bethlehem, Pa., have overwhelmingly voted to consolidate, and the new form of government will go into effect Jan. 1, 1918. Charles M. Schwab was chief sponsor of the consolidation. The city will be known as Bethlehem.

Machinery Markets and News of the Works

MANY ORDERS BEING PLACED

Government Work Is Principal Factor

Shipbuilding Business Pending Will Add Greatly to Other Extensive Purchases of Machinery and Tools

Considerable shipbuilding business is pending, and word from Washington that the United States Shipping Board Emergency Fleet Corporation is going ahead more actively with its steel shipbuilding program leads many in the trade to believe that additional contracts for ships will be placed this week, and that the resultant demand for yard and shop equipment will be large.

New shipbuilding concerns are continually being heard of, but upon investigation it is found that no definite announcement of plans can be made until the Government authorizes them to go ahead. One of the projected plants is that of the American International Corporation, which is to build 50 wooden ships at a time, and which will have the backing necessary to make it a success. Inquiries for equipment have already been made by this concern. Plans which the Submarine Boat Corporation and the Lackawanna Bridge Co. have been jointly making for a shipbuilding plant on Newark Bay are believed to be in behalf of the Government, and to be identical with the yard which General Goethals mentions will be begun by the Government at Newark. The Foundation Co. of New York is reported to have obtained a contract to build about 100 ships for the Allies, and these, it was said, would probably be constructed at the plant near Vancouver, B. C.

The Newport News Shipbuilding & Dry Dock Co. added to its already extensive purchases last week by closing for about $50,000 worth of punching and shearing machinery. The recent purchases by the Union Iron Works in this market are for the equipment of a large machine shop to be used in the construction of submarines, torpedo boat destroyers and cruisers for the United States Navy. The Westinghouse Electric & Mfg. Co. has been making extensive purchases for its new plant at Lester, Pa., which will make turbines for naval vessels.

The American Brake Shoe & Foundry Co. has issued a list of about 240 machines required for its Erie, Pa., plant, which will make shells. The Erie Forge Co. wants machines for making 6-in. guns. An Ohio manufacturer has issued a list of about 60 machines. The T. H. Symington Co., Rochester, N. Y., which has a contract for 2,000,000 shrapnel, has been a large buyer in the New York market. The Bethlehem Steel Corporation is reported to have received a contract for 1,000,000 shrapnel, in preparation for which large purchases of machine tools have been recently made. The equipment bought by the Worthington Pump & Machinery Corporation for its shell-making plant at Hazelton, Pa., is said to total about $50,000. The Sprague Electric Works of the General Electric Co. has bought a large number of automatic tools for the Bloomfield, N. J., plant. The Savage Arms Co., which has recently bought heavily, will build a $1,000,000 addition to its Sharon, Pa., plant, and will also add to its Utica, N. Y., plant, to take care of large war orders. The American Radiator Co. has completed purchases aggregating about $150,000. Five leading Milwaukee metalworking manufacturers have, at the request of the Government, organized a company and will equip a plant for the manufacture of 3-in. field pieces.

Motor truck manufacturers, especially in the Central West, are making purchases of tools for building Government trucks, but the pleasure car industry is inactive, and one large order for tools placed by a manufacturer of pleasure cars has been cancelled. The Fifth Avenue Coach Co., New York, has been buying a few tools and is expected to come into the market soon to buy equipment for a $1,000,000 motor bus factory, which will be erected in the Harlem district of New York, and which will manufacture motor buses for the Army. Plans being made by automobile manufacturers in Detroit indicate that that city will take pre-eminence in the airplane industry.

The Pennsylvania Railroad Co. has revived an inquiry for tools for a blacksmith's shop at its Altoona, Pa., car works. This inquiry has been in the market several times within the past 18 months, but it is understood that purchases will now be made in order to provide the additional facilities required for the 2225 freight cars, which the railroad company will build at the Altoona works.

Crane builders are not seeking business very actively because they are already sold up for many months, and they do not want to commit themselves any farther ahead in view of the probable demand that will be made upon them to provide quick deliveries of cranes to the shipyards which will construct merchant ships for the Emergency Fleet Corporation. In bids recently submitted to the Navy Department for furnishing electric traveling cranes for the structural shop, Navy Yard, New York, the periods of delivery specified ranged from 180 to 400 days. The Youngstown Sheet & Tube Co., Youngstown, Ohio, has purchased a few cranes and the Jones & Laughlin Steel Co., Pittsburgh, has bought six 15-ton cranes. The Alan Wood Iron & Steel Co., Philadelphia, has bought one 30-ton crane. The Shaw Electric Crane Co. received the contract for nine electric traveling cranes for the Watertown Arsenal. These cranes range in capacity from 5 to 150 tons. Similar equipment will be required soon for the Rock Island Arsenal, Rock Island, Ill. The purchasing department of the American Smelting & Refining Co., with its subsidiaries, the Chile Exploration Co.,, the Braden Copper Co. and the Utah Copper Co., 120 Broadway, New York, has bought a number of cranes and has inquiries out for a number of others. Some of these are for shipment to South America and Mexico. The Fletcher-Thompson Co., Bridgeport, Conn., and Newark, which is building the new plant of the Union Smelting & Refining Co., is in the market for cranes.

New York

NEW YORK, July 18.

The opinion prevails in the trade that the sold-up condition of machinery and machine-tool building plants will make it difficult to equip snipyards with the speed which many of the shipbuilders seem to believe is possible. There is no hint as yet that the Government will commandeer plants or their output, but there is an expectation that such a program may be necessary in order to provide equipment quickly.

Business continues active. Some large orders have been placed and others of good size are pending. There has been an urgent demand recently for grinders, with the result that the Norton Grinding Co. and the Heald Machine Co., both of Worcester, Mass., have bought new equipment here to increase output.

The export embargo will not greatly disturb the machinery trade inasmuch as sales recently have been largely confined to the allied countries, and it is understood there will be no restriction on these shipments. In a few instances permits have been denied for shipments of machines to Sweden.

The Diamond Furniture Co., Jamestown, N. Y., has had plans prepared for a four-story factory, 25 x 105 ft., to be erected this summer. H. F. Love is manager.

The Northeast Electric Co., Syracuse, N. Y., has let contracts for erection of a two-story and basement factory, 60 x 120 ft.

The Jupiter Machine Mfg. Co., Richmond, N. Y., has been incorporated with capital stock of $50,000 by E. A. Dippel, C. A. Stick and G. N. Thompson to manufacture punching and shearing machinery.

The Shepherd Crane & Hoist Co., Montour Falls, N. Y., will build a one-story addition, 90 x 200 ft., to its pattern building to cost $75,000.

The Ludlum Steel Co., Watervliet, N. Y., will build an addition to its plant on Spring St. Edward Corning is president.

The W. A. Mills Brass Co., Inc., Port Chester, N. Y., has been incorporated with capital stock of $25,000 to manufacture articles from brass, copper and other metals. W. A. Mills, W. A. Mills, Jr., and C. W. Stevens, Port Chester, are the incorporators.

Frederic D. Bourke, 701 McBride Street, Syracuse, N. Y., will erect a machine shop and armature factory, 55 x 130 ft., two stories, on Marcellus Street.

The Seneca Electric Furnace Corporation, Albany, has been incorporated with a capital stock of $100,000 to manufacture electrical furnaces, etc., with F. W. Cameron, D. B. Wade and F. W. Gebhard, Albany, as directors.

The Fold-Easy Mfg. Co., Inc., Elmira, N. Y., capitalized at $600,000, has been organzied to manufacture folding beds, folding merchandise and patented articles. M. C. P. Parker, R. W. Parker, 527 Lake Street, and C. W. Tome, 505 Magee Street, are the incorporators.

The Hudwill Corporation, New York, has been incorporated with a capital of $50,000 to manufacture machinery for contractors' use. W. K., H. P. and M. W. Rose, 7 West Forty-fifth Street, are the incorporators.

The P. H. Gill & Sons Machine Works, 2 Lorraine Street, Brooklyn, N. Y., have had plans prepared for a two-story machine shop addition.

The Evertite Locknut Corporation, New York, has been incorporated with a capital of $150,000 to manufacture lock nuts and similar specialties. G. F. Jebbet, A. F McCabe and A. E. Moore, 37 Wall Street, are the incorporators.

Anselm P. Anderson and K. R. Norton, New York, have incorporated in Delaware the Chase Adding Machine Corporation, with capital of $1,000,000 to manufacture adding and recording machines and typewriters

The Adriance Machine Works, Inc., 254 Van Brunt Street, Brooklyn, N. Y., specializing in the production of presses, dies, etc., is building a six-story, reinforced-concrete addition, 100 x 200 ft., on Richards Street. A one-story extension, 50 x 100 ft., will be used as an erecting shop. The cost is estimated at $200,000. Benjamin Adriance is president.

The Hungerford Brass & Copper Co., 80 Lafayette Street, New York, has filed plans for the erection of a new two-story building, 46 x 103 ft., at 90-92 White Street, to cost about $25,000.

E. D. Anderson, Inc., has been incorporated to manufacture machinery. Announcement of plans will be made soon by Mr. Anderson, whose office is at 120 Broadway. Associated with him as incorporators are Hamilton M. Dawes, O. J. Wagner, C. M. Chester, Jr., C. Westley Abbott and S. Alpert, all of the same address.

The Fire Gun Mfg. Co., Huntington, L. I., has been incorporated with a capital of $500,000 to manufacture fire extinguishers. A. V. Sammis, W. N. and R. S. Baylis, Huntington, are the incorporators.

Parke L. Woodward, Great Kills, Staten Island, N. Y., and associates, have incorporated in Delaware the Falcon Mfg. Co., with capital of $750,000, to manufacture aeroplanes and other aircraft. Joseph P. Shelby, Edgemere, L. I., and Howard Seay, New York, are also interested.

The Crouse-Hinds Co., Seventh and North streets, Syracuse, N. Y., manufacturer of electrical appliances, has completed the erection of a new foundry on Wolf Street.

The Miller-Jones Corporation, Syracuse, has been incorporated with a capital of $20,000 to operate a general machine shop and specialize in the manufacture of sheet metal goods. Frank E. Miller and Arthur L. Jones, are the incorporators.

The Niagara Sprayer Co., Elizabeth Street, Middleport, N. Y., has increased its capital from $50,000 to $500,000. It specializes in the manufacture of spraying machines.

The Porter-Cable Machine Co., 501 East Water Street, Syracuse, manufacturer of machinery and machine tools, has acquired property at Dewitt, near Syracuse, for the construction of a new plant. The initial building will be one story, about 150 x 200 ft., and is expected to be ready for occupancy before the close of the year. Walter A. Ridings is president.

The Syracuse Washer Corporation, Syracuse, N. Y., has been incorporated with a capital of $15,000 to manufacture washing machines. J. Garrett Hotaling, John N. Dersching and Walter J. Zwill are the incorporators.

The Warsaw Elevator Co., Warsaw, N. Y., has increased its capital from $50,000 to $250,000.

The Kingston Shipbuilding Corporation, Kingston, N. Y., has been incorporated with a capital of $500,000 to operate a local shipbuilding works. J. D. Schoonmaker, M. J. Look and J. O. Winston, Kingston, are the incorporators.

The Savage Arms Corporation, Savage Avenue, Frankfort, N. Y., manufacturer of firearms and ammunition, has had plans prepared for four new additions to its plant, to consist of three machine shops, two four stories, 50 x 280 ft. and 50 x 220 ft., respectively, one one-story, 35 x 270 ft., and a two-story office building. An electric power plant will also be constructed. F. R. Phillips is assistant manager. John G. Brown, Witherspoon Building, Philadelphia, has the contract for erection.

The Buffalo Foundry & Machine Co., East Ferry Street and Fillmore Avenue, Buffalo, N. Y., manufacturer of machinery and castings, will build a new pattern shop on Fillmore Avenue.

The World Aeroplane Co., Buffalo, has been incorporated with a capital of $1,000,000, to manufacture aeroplanes and hydroplanes. E. H. and H. E. Crowder and J. H. Kalnar, Buffalo, are the incorporators.

Louis Sacks, Newark, N. J., operating a foundry on Hamburg Place for the production of gray iron castings, will make extensions and alterations in his core ovens.

The Universal Caster & Foundry Co., 574 Ferry Street, Newark, has been organized to manufacture metal and steel posts and similar specialties. Daniel B. Diso heads the company.

Carrington & Co., 42 Walnut Street, Newark, manufacturers of jewelry, have acquired property adjoining their plant and are said to be planning for extensions.

The Foley Motor Car Co., Newark, has been incorporated with a capital of $25,000 to manufacture motor cars and parts. E. J. and F. P. Foley, Montclair; and Peter A. Bannigan, Paterson, are the incorporators.

The General Electric Co., Harrison, N. J., has taken bids for the construction of a one and two-story, reinforced-concrete addition, 135 x 235 ft., to its Edison Lamp Works plant, Sussex Street, estimated to cost $200,000.

The National Hoisting Engine Co., Harrison, is having plans prepared for a one-story addition, about 200 ft. long, to its hoisting engine works.

Jacques Wolf & Co., Lexington Avenue, Clifton, N. J., manufacturer of chemicals, will build a one-story machine shop addition to their plant at Lexington Avenue and Center Street, 30 x 50 ft. A three-story extension, 60 x 77 ft., will also be constructed.

The Union Rubber Co., Kenilworth, near Cranford, N. J., has been incorporated with a capital of $35,000 to manufacture rubber products. William Pettit and J. Hiller, Jr., are the principal incorporators.

The American Automotive Co., Camden, N. J., has been incorporated with a capital of $35,000 to manufacture aeroplanes. William B. MacDonald, 19 Broadway, William H. Ambuhr and Burt K. Brandle, Camden, are the incorporators.

The Marion Metal Co., Jersey City, N. J., operating a plant at 988 Newark Avenue, has filed notice of organization to manufacture metal, iron and rubber specialties. Louis Schreiber, 143 Tonnele Avenue, Jersey City, and Louis Rosenhaus, 628 Boulevard, Bayonne, head the company.

Henry Byrne, 392 Mercer Street, Jersey City, N. J., contractor, will build a new one-story, brick machine shop at 396-8 Mercer Street.

The Electro-Dynamic Co., Avenue A, Bayonne, N. J., manufacturer of motors, dynamos, etc., has filed plans for the construction of the proposed one-story addition to its works at Avenue A and North Street, to be 100 x 120 ft. John W. Ferguson, 152 Market Street, Paterson, has the contract.

A. A. Kelley, Montclair, N. J., and associates, have incorporated in Delaware the American Safety Nut Lock Co., with capital of $100,000, to manufacture a special nut lock. Arthur C. Platt and W. J. Arkell, New York, are also interested.

New England

BOSTON, July 16.

The week has been marked by a sudden lull in the demand for machine tools and an absence of inquiries of any size. Reports from machine tool builders indicate that this condition is purely local, as inquiries from their New York and Western agents have increased in volume in the last 10 days. Orders show some increase, which would be much larger if New England factories were not generally sold up for months ahead and in no position to make prompt deliveries outside of Government business.

While Government orders are being held under cover as much as possible by manufacturers who have them, it is becoming known that the number of metal working plants in this section that are turning a large part of their production to Government work is increasing rapidly. Labor shortage is becoming a pressing problem again as the larger industrial centers are responding to the demands of our war program. Bridgeport papers report that there has been a 30 per cent increase in the city's factory payroll in the last two months and that the present weekly payrolls total more than $1,500,000. If figures were available for the other munition and machine tool centers, a corresponding increase would be shown.

The Skinner Chuck Co., New Britain, Conn., has issued additional shares of stock to the value of $100,000. The outstanding stock is $175,000.

The Phelps & Farr Mfg. Co., Woodbury, Conn., has bought a factory formerly used as a silk mill, together with eight employee's houses, and is equipping the plant to make small metal goods. J. W. Phelps, Waterbury, is president and treasurer, and Leon Farr is general manager.

The Portland Shipbuilding Co., South Portland, Me., is beginning the construction of two beam trawlers for the East Coast Fisheries Co. The Portland Co., Portland, will furnish the boilers and engines.

The Moss Pump & Engine Works, Boston, has been incorporated with authorized capital stock of $50,000. The directors are Louis L. Green, president; James W. Moss, 41 South Market Street, treasurer; and C. G. Weld.

The Springfield Carburetor Co., Springfield, Mass., has been incorporated with authorized capital stock of $500,000. The directors are Anton C. Schmelzer, president; Frank W. Arthur, treasurer; and George H. Morgenstern.

The Woburn Machine Co., Woburn, Mass., has awarded a contract for an addition, 40 x 57 ft., one story.

The Steam Motors Co., Springfield, Mass., has been incorporated with authorized capital stock of $25,000. The directors are E. F. Gebhardt, Jr., president; Irving B. Hitchings, Lynn, treasurer; and William J. A. London.

The Universal Grinding Co., 67 Walnut Street, Fitchburg, Mass., has awarded a contract for an addition, 40 x 83 ft., one story, to be used as an erecting room.

The Freeport Shipbuilding Co., Freeport, Me., has been incorporated with authorized capital stock of $100,000 by Julius S. Soule, president; Norman C. Soule and Albert C. Soule.

The Fore River Shipbuilding Corporation, Quincy, Mass., has awarded a contract for a machine shop, 135 x 250 ft., one story, and a boiler shop, 72 x 150 ft., one story.

The New London Ship & Engine Co., Groton, Conn., has awarded a contract for a pipe shop addition, 64 x 117 ft., one story.

Landers, Frary & Clark, New Britain, Conn., have awarded a contract for an addition, 47 x 220 ft., one story.

The Spring Perch Co., Stratford, Conn., is to erect a factory building, 132 x 360 ft., one story.

The Bath Iron Works, Bath, Me., a shipbuilding plant, has been sold by the estate of John S. Hyde, principal owner and for many years president of the company, to a syndicate of Maine bankers, who will develop the property in an effort to help meet the growing demand for tonnage. William T. Cobb, former Governor of Maine, chairman of the Maine Shipbuilding Committee, was elected president of the new corporation, which is said to have contracts to build nine torpedo boat destroyers for the United States Navy at a cost of $10,00,000.

Philadelphia

PHILADELPHIA, July 16.

The H. Belfield Co., 435 North Broad Street, Philadelphia, manufacturer of steam fittings and plumbers' supplies, is having plans prepared for its proposed new plant at Nineteenth, Twentieth and Cambria streets. It will consist of a five-story reinforced-concrete building, 100 x 280 ft.; one-story building of like dimensions, and one-story foundry about 100 x 275 ft. A one-story power plant will also be constructed. The William Steele & Sons Co., 1600 Arch Street, is the architect.

The John Illingworth Steel Co., Tacony and Lewis streets, Philadelphia, specializing in the production of iron and steel bars, has filed plans for the construction of an addition to its machine shop.

The Bureau of Yards and Docks, Navy Department, has awarded a contract for the erection of three new shell houses and four magazine buildings at its Fort Mifflin, Philadelphia, works, to cost about $500,000. J. Henry Miller, Eutaw and Franklin streets, Baltimore, Md., has the contract.

The Niagara Mfg. Co., 323 North Second street, Philadelphia, manufacturer of plumbers' fittings and supplies, has had plans prepared for a one-story and basement addition, about 80 x 80 ft., at 5432 Lancaster Avenue. Frank E. Hahn, 1112 Chestnut Street, is the architect.

The Penn Chemical Works, 1332 Washington Avenue, Philadelphia, will erect a new one-story power house, about 20 x 45 ft., and engine house, 46 x 48 ft., at 1326 Washington Avenue, to cost $22,000.

The DeLong Hook & Eye Co., Broad and Wallace streets, Philadelphia, manufacturer of metal specialties, has awarded contract for the construction of its proposed new plant at Twenty-first and Clearfield streets, at a cost of $160,000, to consist of a four-story reinforced-concrete building, 88 x 225 ft. The William Steele & Sons Co. is the contractor.

The United States Government has awarded a contract for the erection of three new buildings at the Frankford Arsenal, Philadelphia, to comprise a two-story artillery ammunition plant, 50 x 180 ft., with wing 47 x 50 ft., and two one-story structures 47 x 150 ft., and 47 x 47 ft.

The Henry Disston & Sons Co., Tacony, Philadelphia, manufacturer of saws, files, etc., has awarded a contract for the construction of a one-story brick and concrete addition.

The Arguto Oilless Bearing Co., Wayne Junction, Philadelphia, manufacturer of pulleys, bearings, etc., has taken bids for the erection of a new factory at Berkeley and Wayne avenues.

The S. S. White Dental Mfg. Co., Twelfth and Chestnut streets, Philadelphia, manufacturer of dental and scientific instruments, has awarded a contract for the construction of a four-story reinforced-concrete addition, 60 x 75 ft., to its plant at 212-20 South Quince Street. The Turner Concrete Steel Co., 1713 Sansom Street, is the contractor.

The Herez Light Supply Co., Philadelphia, has been incorporated under Pennsylvania laws with a capital of $25,000 to manufacture electric and gas fixtures. Samuel Straussmann, 1523 Poplar Street, is the principal incorporator.

Hord & Co., Inc., 100 Broadway, New York, has announced plans in connection with the acquisition of the property of the Keystone State Fair & Industrial Exposition Co., Middletown, Pa., by the Keystone Industrial Corporation, Harrisburg, Pa., recently organized with a capital of $1,500,000. It is proposed to commence the immediate erection of the first unit of a plant for the manufacture of aeroplanes, hydroplanes, etc., including the production of engines for aircraft. Following the erection of the aeroplane works, it is planned to build a plant for the manufacture of special steam turbine engines for industrial service.

The Hale Fire Pump Co., Conshohocken, Pa., has been incorporated with a capital of $25,000 to manufacture pumping machinery. Everett J. Wendell, Wayne, is the principal incorporator.

Directors of the Lehigh Stove & Mfg. Co., Lehighton, Pa., manufacturer of stoves, heaters, etc., have authorized an increase in the present plant capacity to cost about $60,000.

The Pottstown Steel Plate Products Co., Pottstown, Pa., has commenced the erection of a new plant. F. H. Feister & Co., Pottstown, have the contract.

The O. K. Clutch & Machine Co., Columbia, Pa., manufacturer of hangers, bearings, etc., has taken bids for the construction of a one-story addition, 60 x 130 ft., on Florence Street.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., states that five acres which it recently purchased are not to be used for extensions, but are simply dumping grounds for slag and ashes.

The Benjamin Iron & Steel Co., Hazleton, Pa., is erecting a new iron foundry for general work, and is also building a plant to be devoted to pattern work and the manufacture of mine and stripping cars and steam shovel repair parts. This work was recently announced as being done by the Central Pennsylvania Quarry, Stripping & Construction Co.

The Jeanesville Iron Works, Hazleton, Pa., manufacturer of pumps, has awarded a contract for the erection of a new one-story machine shop, 50 x 335 ft. John G. Brown, Witherspoon Building, Philadelphia, is the contractor. The Worthington Pump & Machinery Corporation, 115 Broadway, New York, operates this company.

The Pusey & Jones Co., Poplar Street, Wilmington, Del., has leased land from the city at Spruce Street and Christiana River. It is reported that the site will be used for an addition to its shipbuilding works.

The Tourgees Specialty Co., Williamsport, Pa., has been incorporated with a capital stock of $10,000 to manufacture incinerators, castings, stampings and forgings. The incorporators are Elizabeth H. Gibbs, C. Edmund Gilmore and Walter C. Gilmore.

The Frankford Machine Co., Philadelphia, has been incorporated with a capital stock of $20,000 to manufacture devices from iron, bronze or brass. The incorporators are Frederick J. Wilkes, 5348 James Street, and others.

The H. A. Bauer Co., Lansdowne, Pa., has been incorporated with a capital stock of $30,000 to manufacture gas and electrical fixtures and supplies. The incorporators are H. A. Bauer, 22 South Lansdowne Avenue, Lansdowne; Guy F. Bauer, 219 South Farragut Terrace, Philadelphia, and James H. Bell, 1815 Land Title Building, Philadelphia.

The Ralph E. Weeks Co., Scranton, Pa., has been incorporated with a capital stock of $200,000 to manufacture plumbers', steamfitters' and tinners' supplies. The incorporators are Ralph E. Weeks, Martin F. Corcoran and Arthur W. Close.

The Penn Electric Service Co., Johnstown, Pa., has commenced the erection of a new power plant at Rockwood to furnish power in the southern part of Somerset County.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has awarded a contract for the erection of a one-story reinforced concrete addition, 20 x 40 ft., to its powerhouse at Delaware Avenue and Robbins Street.

The Quakertown Stove Works, 321 West Broad Street, Quakertown, Pa., has been incorporated with a capital stock of $300,000 to manufacture stoves, heating equipment and castings. The incorporators are William P. Roberts, William P. Winner, Norman H. Moyer, Quakertown, and William B. Conrad, 4419 Uber Street, Philadelphia.

Catalogs Wanted

The Chester Shipbuilding Co., Bristol, Pa., desires to receive catalogs of shipbuilding machinery and equipment. L. W. Carver is general storekeeper.

Baltimore

BALTIMORE, MD., July 16.

Morton McI. Dukehart & Co., 100-102 West Fayette Street, Baltimore, manufacturer of pumps and engines, has been awarded a Government contract for 700 vertical boiler feed pumps and their parts, on a bid of $400,000. Delivery is to be started in five months and to be completed in 16 months. The company acted as agents for the McGowan Pump Co.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg streets, Baltimore, will erect a two-story factory building, 135 x 374 ft., on Wicomico Street near Carey, to cost about $50,000.

The Norfolk & Western Railway Co., Norfolk, Va., will build a 46 x 70-ft. power house.

The H. E. Crook Co., Inc., 28 Light Street, Baltimore, which recently purchased the shipbuilding plant of the McLean Contracting Co., announces that it will not make any additions at the present time. The property comprises a water frontage of about 900 ft and about 600 ft. depth of land, and is improved with a pier about 75 x 500 ft. There are several shop buildings and an office building on the ground. The company has constructed three ship ways and is ready to lay keel. It has been incorporated with $250,000 capital. The officers are: H. E. Crook, president; Clarence H. Crook, vice-president; W. S. Handy, secretary; H. R. Bushman, treasurer.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, is having plans prepared for a two-story addition to its plant, about 46 x 90 ft.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the erection of three new shop buildings at the Charleston, W. Va., navy yard, to consist of a one-story machine shop, 111 x 402 ft., forge and foundry shop, 135 x 562 ft., and heat treating plant, 92 x 150 ft.

The Nox Automatic Air Governor Co., Charleston, W. Va., has been incorporated with a capital of $50,000 to manufacture internal combustion engines and automobile specialties. Wade E. Guthrie, T. C. Townsend, T. S. Clark and T. H. Ballard are the incorporators.

Chicago

CHICAGO, July 16.

No large orders have come to the trade, but the general run of business continues satisfactory. The demand for second-hand tools has been good, especially for heavy machines, more of which are wanted than are available. Manufacturers are in great need of heavy planers.

Shipments on most tools are proceeding in a satisfactory way, indicating that the labor situation at tool-building plants is at least fair, also that cars are more readily obtainable for shipments.

No new munitions orders are reported, but it is known that the Rock Island Arsenal, Rock Island, Ill., must soon require equipment for the large plants on which contractors are at work.

Standard makes of tools are difficult to obtain promptly, especially milling, shaping and grinding machines, radial drills, planers and large turret lathes. Hand-screw machines and the smaller sizes of lathes are easy to find. Horizontal boring and drilling machines are scarce, while some makes of vertical boring mills cannot be had inside of eight months.

Automobile truck manufacturers have found Government specifications for army motor trucks to be extremely rigid, as the trucks are designed for unusually hard service. The requirements are much more severe than those of commercial trucks. New orders will be more easily handled. There is no change in the pleasure automobile industry, and one seller of tools had the situation brought home to him by the cancellation of an order this week. Considerable thought is being given to the effect on labor supply of the draft which is soon to become effective, the general opinion being that it will slow up manufacturing operations until conditions are readjusted.

The Ocean Floating Safe Co., 803 West Madison Street, Chicago, has purchased land at Grand and Kilbourne Avenues, 146 x 221 ft., where it plans to build a factory to cost $70,000 for the manufacture of floating safes. Nenotti Nanni is president.

The Carbo-Hydrogen Co. of America, Pittsburgh, has purchased about three acres in South Chicago, upon which a factory is being built. The cost is estimated at $15,000.

A one-story mill construction factory, 75 x 100 ft., costing about $15,000, is to be constructed at 1650 Walnut Street, Chicago, for Harry I. Holton, real estate, 140 South Dearborn Street.

The Gerlach Barklon Co., Joliet, Ill., will erect a three-story reinforced concrete factory, about 94 x 200 ft.

The Gary Motor Truck Co., Gary, Ind., is installing machinery and soon will begin operations in its new plant with about 50 men. The company started in a temporary plant at Hobart over a year ago.

The Great Lakes Mfg. Co., North Chicago, has been incorporated with a capital stock of $12,000, by H. C. Pomeroy and William A. Witt, Chicago, and Frank N. Tomlinson.

The Midland Electric Steel Co., Chicago, has been incorporated with a capital stock of $10,000 by Joseph S. Samuels, Stanley Filip and R. I. Davis. Associated with the company is J. B. Moos, Lakeview Building, Chicago. Equipment will be supplied by the recently organized Booth-Hall Co., Chicago.

The Twentieth Century Brass Works, Bellevue, Ill., has been incorporated with a capital stock of $25,000 by William Althoff, Henry A. Lengfelder and Walter J. Ruediger.

The Mine Shaft Signal Co., Carrier Mills, Ill., has been incorporated with a capital stock of $10,000 by J. A. Schellenger, Samuel W. Latham and Harry Mandrell.

The Remy Brothers Co., recently organized to manufacture tractors, has leased the buildings and grounds of the Kokomo Foundry & Machine Co., Kokomo, Ind.

The Weaver Mfg. Co., Springfield, Ill., manufacturer of automobile accessories, is about to begin the construction of an addition to its plant. It will be of brick, one story, and cost $15,000.

The Oblong Machine Co., Oblong, Ill., whose business has been principally with oil well companies, is moving its plant to Marietta, Ohio, where there is a greater demand for oil well equipment. The company was established at Oblong at the beginning of the oil boom in that section.

The Besaw Rubber Co., and the Ardmore-Akron Rubber Co., makers of automobile tires, have selected sites along the Santa Fe Railroad at Adrmore, Okla., and are planning new factories.

The Duluth Iron Works, Duluth, Minn., has let a contract for the construction of a foundry with a view of undertaking the manufacture of marine engines.

The Chicago & Eastern Illinois Railroad shops at Danville Junction, Danville, Ill., idle for several years, have been leased to an airplane manufacturing company, which has a Government contract. The shops have five acres of floor space.

The Steamotor Truck Co., Chicago, a Delaware corporation, has increased its capital from $100,000 to $10,000,000 for expansion.

Milwaukee

MILWAUKEE, WIS., July 16.

The past week has been one of the most active in the local machine-tool trade since the declaration of war. Orders for milling machines and other tools on Government account, which required in numerous instances the dispatch of machines by express, are the distinct feature of the week. At the same time the rush for tools by private industries, which had slackened somewhat, again has set in. Inquiries and orders of the week constitute the largest volume of any similar period in three months or more. Government requirements are given precedence, but purchasing on this account has not reached a point where private requirements are yet appreciably affected. On some sizes and types of milling machines, especially the universal, local shops are unable to quote nearer than six or seven months ahead.

Manufacturers in all lines are being warned that it is imperative to order raw materials immediately and to urge their customers to stock up now, as prospects are that after Sept. 1 carriers will be overwhelmed with the business of transporting troops, foodstuffs, ammunition, ordnance and other war necessities, and will have practically no surplus facilities for the ordinary business of the country.

The Globe Seamless Steel Tubes Co., Milwaukee, which is improving and enlarging its plant, will begin first with the erection of a new curing and cooling shop, 50 x 480 ft., of steel and brick, designed by Klug & Smith, consulting engineers, Mack Block. Bids are now being received by the engineers. The cost has not been announced, but is estimated at $100,000 with equipment. F. J. O'Brien is general manager.

A. W. Snyder, Burlington, Wis., is completing the organization of a corporation at Milwaukee to manufacture light castings and automobile parts. It is proposed to erect a foundry and machine shop, 120 x 240 ft., one and two stories, at Greenfield Avenue and Barclay Street, Milwaukee. Mr. Snyder has opened offices on the site and will award contracts within a week or 10 days.

The Milwaukee Auto Engine & Supply Co., 841 Twenty-ninth Street, Milwaukee, has increased its capital stock from $50,000 to $100,000 to accommodate its growing business and to provide for future extensions. John B. McCabe is secretary-treasurer.

The Four Wheel Drive Tractor Co., Clintonville, Wis., is closing bids this week for the erection of the first unit of its tractor and engine manufacturing plant, 70 x 175 ft., one-story, with saw-tooth roof. The company will produce farm and general purpose tractors employing a duplex drive transmission system.

The Fox River Cornice Co., Green Bay, Wis., manufacturing art and corrugated sheet metal goods, is increasing its capacity about 33 per cent and has taken over an adjoining building and installing new equipment. The addition gives the company an area of 66 x 120 ft., with a warehouse, 45 x 90 ft.

The Silent Washer Co., Clintonville, Wis., manufacturer of washing machines, formerly of Appleton, Wis., has plans prepared for a two-story factory, 40 x 120 ft., of reinforced concrete and brick, to cost about $30,000 complete. The Appleton works will be moved to Clintonville as soon as the factory is completed. Robert Fischer is secretary.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., which recently completed work on a new plant, will confine itself to small pumping engines and motor-driven pumps upon the completion of the larger types now being built on order. Frank Mertel has been appointed general manager following the resignation of Fred Ziegahn, who established the works with his son and now returns to Minneapolis, Minn., to engage in the foundry and machine-shop business.

The Langlade Lumber Co., Antigo, Wis., intends to rebuild immediately the roundhouse, machine and blacksmith shops at Bass Lake, Wis., destroyed by fire July 5.

The Sivyer Steel Casting Co., Milwaukee, has awarded the contract for an addition, 150 x 260 ft., to its foundry to the Robert L. Reisinger Co., 1327 First National Bank Building, Milwaukee. A 3-ton electric furnace will be installed, as previously noted.

Westinghouse Church Kerr & Co., New York, have the contract for erecting and equipping a new power plant, costing $40,000, for the Great Northern Railway, Belknap Street, Superior, Wis.

The Mohr-Jones Hardware Co., Racine, Wis., is erecting a shop for working sheet metal. The company recently increased its capital stock from $60,000 to $150,000.

George Freiburger & Sons, New London, Wis., have broken ground for a one-story addition, 50 x 75 ft., to their machine-shop and wagon works.

The Burlington Truck Co., Burlington, Wis., has been organized by members of the Burlington Blanket Co. and will establish a plant in the Ebbers Building to manufacture truck units for Ford chassis.

The Maibohm Wagon Co., Racine, Wis., which engaged in the manufacture of passenger automobiles about a year ago, has reorganized as the Maibohm Motors Co., with a capital stock of $500,000, under a Maine charter.

The Charles Kidd Mfg. Co., Kenosha, Wis., maker of dairy machinery and milk coolers, contemplates moving its plant and offices to Janesville, Wis., where the Commercial Club is raising a fund of $4,000 to defray moving expenses. If the change is made the company will occupy one of the buildings of the Wisconsin Carriage Co., which will be taken over under purchase. It is hoped to start operations in Janesville by Sept. 1.

The Turbo Carburetor Co., Milwaukee, organized six months ago by I. M. Smith and associates, has completed the equipment of a foundry and machine-shop at 150 Clinton Street, and is manufacturing gas engine carburetors. The capital stock is $60,000. Frederick L. Sivyer, head of the Northwestern Malleable Iron Co., is president, and I. M. Smith, general manager.

The Globe Shipbuilding Co., Superior, Wis., incorporated with a capital stock of $50,000, has re-incorporated under Delaware laws with $500,000 capital, divided into $100,000 of 7 per cent preferred and $400,000 common stock. The officers and stockholders remain unchanged. No preferred stock has been issued. The company is rushing work on the equipment of its shipyards and boat construction will begin in about 10 days. Bookings include eight ocean-going trawlers and construction of two ocean-going cargo vessels of the Frederickstadt type will begin immediately. The Globe company has bought the steamer C. S. Barker for $10,000 and will fit it out as a repair-ship. B. C. Cooke is president; C. A. Massey, vice-president, and M. L. McMahon, secretary-treasurer.

The Independent Foundry Co., Milwaukee, organized with $25,000 capital, has elected the following officers: President, Julius Raniszewski; secretary, August Fons; treasurer, Frank Sprader. Contracts will be awarded immediately for the erection and equipment of a gray-iron foundry, 75 x 120 ft., at Fifty-fourth Avenue and Burnham Street, West Allis. The initial investment will be about $20,000.

It is reported that the Racine Rubber Co., Racine, Wis., is preparing to enlarge its steam-generating plant, and will buy a new engine, generator, boiler and automatic stoker equipment. L. Carlson is engineer in charge.

Libby, McNeil & Libby, Chicago, have purchased a site at Ripon, Wis., upon which to build a milk condensing and refrigerating plant costing about $50,000.

The Wisconsin Carriage Co., Janesville, Wis., has changed its style to the Janesville Products Co., and increased the capital stock from $100,000 to $130,000.

The Bukolt Mfg. Co., Stevens Point, Wis., maker of steel-shod tire protectors for motor vehicles and trailers, last week moved into the plant formerly occupied by the

New York

NEW YORK, July 18.

The opinion prevails in the trade that the sold-up condition of machinery and machine-tool building plants will make it difficult to equip shipyards with the speed which many of the shipbuilders seem to believe is possible. There is no hint as yet that the Government will commandeer plants or their output, but there is an expectation that such a program may be necessary in order to provide equipment quickly.

Business continues active. Some large orders have been placed and others of good size are pending. There has been an urgent demand recently for grinders, with the result that the Norton Grinding Co. and the Heald Machine Co., both of Worcester, Mass., have bought new equipment here to increase output.

The export embargo will not greatly disturb the machinery trade inasmuch as sales recently have been largely confined to the allied countries, and it is understood there will be no restriction on these shipments. In a few instances permits have been denied for shipments of machines to Sweden.

The Diamond Furniture Co., Jamestown, N. Y., has had plans prepared for a four-story factory, 25 x 105 ft., to be erected this summer. H. F. Love is manager.

The Northeast Electric Co., Syracuse, N. Y., has let contracts for erection of a two-story and basement factory, 60 x 120 ft.

The Jupiter Machine Mfg. Co., Richmond, N. Y., has been incorporated with capital stock of $50,000 by E. A. Dippel, C. A. Stick and G. N. Thompson to manufacture punching and shearing machinery.

The Shepherd Crane & Hoist Co., Montour Falls, N. Y., will build a one-story addition, 90 x 200 ft., to its pattern building to cost $75,000.

The Ludlum Steel Co., Watervliet, N. Y., will build an addition to its plant on Spring St. Edward Corning is president.

The W. A. Mills Brass Co., Inc., Port Chester, N. Y., has been incorporated with capital stock of $25,000 to manufacture articles from brass, copper and other metals. W. A. Mills, W. A. Mills, Jr., and C. W. Stevens, Port Chester, are the incorporators.

Frederic D. Bourke, 701 McBride Street, Syracuse, N. Y., will erect a machine shop and armature factory, 55 x 130 ft., two stories, on Marcellus Street.

The Seneca Electric Furnace Corporation, Albany, has been incorporated with a capital stock of $100,000 to manufacture electrical furnaces, etc., with F. W. Cameron, D. B. Wade and F. W. Gebhard, Albany, as directors.

The Fold-Easy Mfg. Co., Inc., Elmira, N. Y., capitalized at $600,000, has been organzied to manufacture folding beds, folding merchandise and patented articles. M. C. P. Parker, R. W. Parker, 527 Lake Street, and C. W. Tome, 505 Magee Street, are the incorporators.

The Hudwill Corporation, New York, has been incorporated with a capital of $50,000 to manufacture machinery for contractors' use. W. K., H. P. and M. W. Rose, 7 West Forty-fifth Street, are the incorporators.

The P. H. Gill & Sons Machine Works, 2 Lorraine Street, Brooklyn, N. Y., have had plans prepared for a two-story machine shop addition.

The Evertite Locknut Corporation, New York, has been incorporated with a capital of $150,000 to manufacture lock nuts and similar specialties. G. F. Jebbet, A. F McCabe and A. E. Moore, 37 Wall Street, are the incorporators.

Anselm P. Anderson and K. R. Norton, New York, have incorporated in Delaware the Chase Adding Machine Corporation, with capital of $1,000,000 to manufacture adding and recording machines and typewriters

The Adriance Machine Works, Inc., 254 Van Brunt Street, Brooklyn, N. Y., specializing in the production of presses, dies, etc., is building a six-story, reinforced-concrete addition, 100 x 200 ft., on Richards Street. A one-story extension, 50 x 100 ft., will be used as an erecting shop. The cost is estimated at $200,000. Benjamin Adriance is president.

The Hungerford Brass & Copper Co., 80 Lafayette Street, New York, has filed plans for the erection of a new two-story building, 46 x 103 ft., at 90-92 White Street, to cost about $25,000.

E. D. Anderson, Inc., has been incorporated to manufacture machinery. Announcement of plans will be made soon by Mr. Anderson, whose office is at 120 Broadway. Associated with him as incorporators are Hamilton M. Dawes, O. J. Wagner, C. M. Chester, Jr., C. Westley Abbott and S. Alpert, all of the same address.

The Fire Gun Mfg. Co., Huntington, L. I., has been incorporated with a capital of $500,000 to manufacture fire extinguishers. A. V. Sammis, W. N. and R. S. Baylis, Huntington, are the incorporators.

Parke L. Woodward, Great Kills, Staten Island, N. Y., and associates, have incorporated in Delaware the Falcon Mfg. Co., with capital of $750,000, to manufacture aeroplanes and other aircraft. Joseph P. Shelby, Edgemere, L. I., and Howard Seay, New York, are also interested.

The Crouse-Hinds Co., Seventh and North streets, Syracuse, N. Y., manufacturer of electrical appliances, has completed the erection of a new foundry on Wolf Street.

The Miller-Jones Corporation, Syracuse, has been incorporated with a capital of $20,000 to operate a general machine shop and specialize in the manufacture of sheet metal goods. Frank E. Miller and Arthur L. Jones, are the incorporators.

The Niagara Sprayer Co., Elizabeth Street, Middleport, N. Y., has increased its capital from $50,000 to $500,000. It specializes in the manufacture of spraying machines.

The Porter-Cable Machine Co., 501 East Water Street, Syracuse, manufacturer of machinery and machine tools, has acquired property at Dewitt, near Syracuse, for the construction of a new plant. The initial building will be one story, about 150 x 200 ft., and is expected to be ready for occupancy before the close of the year. Walter A. Ridings is president.

The Syracuse Washer Corporation, Syracuse, N. Y., has been incorporated with a capital of $15,000 to manufacture washing machines. J. Garrett Hotaling, John N. Dersching and Walter J. Zwill are the incorporators.

The Warsaw Elevator Co., Warsaw, N. Y., has increased its capital from $50,000 to $250,000.

The Kingston Shipbuilding Corporation, Kingston, N. Y., has been incorporated with a capital of $500,000 to operate a local shipbuilding works. J. D. Schoonmaker, M. J. Look and J. O. Winston, Kingston, are the incorporators.

The Savage Arms Corporation, Savage Avenue, Frankfort, N. Y., manufacturer of firearms and ammunition, has had plans prepared for four new additions to its plant, to consist of three machine shops, two four stories, 50 x 280 ft. and 50 x 220 ft., respectively, one one-story, 35 x 270 ft., and a two-story office building. An electric power plant will also be constructed. F. R. Phillips is assistant manager. John G. Brown, Witherspoon Building, Philadelphia, has the contract for erection.

The Buffalo Foundry & Machine Co., East Ferry Street and Fillmore Avenue, Buffalo, N. Y., manufacturer of machinery and castings, will build a new pattern shop on Fillmore Avenue.

The World Aeroplane Co., Buffalo, has been incorporated with a capital of $1,000,000, to manufacture aeroplanes and hydroplanes. E. H. and H. E. Crowder and J. H. Kalnar, Buffalo, are the incorporators.

Louis Sacks, Newark, N. J., operating a foundry on Hamburg Place for the production of gray iron castings, will make extensions and alterations in his core ovens.

The Universal Caster & Foundry Co., 574 Ferry Street, Newark, has been organized to manufacture metal and steel posts and similar specialties. Daniel B. Diso heads the company.

Carrington & Co., 42 Walnut Street, Newark, manufacturers of jewelry, have acquired property adjoining their plant and are said to be planning for extensions.

The Foley Motor Car Co., Newark, has been incorporated with a capital of $25,000 to manufacture motor cars and parts. E. J. and F. P. Foley, Montclair; and Peter A. Bannigan, Paterson, are the incorporators.

The General Electric Co., Harrison, N. J., has taken bids for the construction of a one and two-story, reinforced-concrete addition, 135 x 235 ft., to its Edison Lamp Works plant, Sussex Street, estimated to cost $200,000.

The National Hoisting Engine Co., Harrison, is having plans prepared for a one-story addition, about 200 ft. long, to its hoisting engine works.

Jacques Wolf & Co., Lexington Avenue, Clifton, N. J., manufacturer of chemicals, will build a one-story machine shop addition to their plant at Lexington Avenue and Center Street, 30 x 50 ft. A three-story extension, 60 x 77 ft., will also be constructed.

The Union Rubber Co., Kenilworth, near Cranford, N. J., has been incorporated with a capital of $35,000 to manufacture rubber products. William Pettit and J. Hiller, Jr., are the principal incorporators.

The American Automotive Co., Camden, N. J., has been incorporated with a capital of $35,000 to manufacture aeroplanes. William B. MacDonald, 19 Broadway, William H. Ambuhr and Burt K. Brandle, Camden, are the incorporators.

The Marion Metal Co., Jersey City, N. J., operating a plant at 988 Newark Avenue, has filed notice of organization to manufacture metal, iron and rubber specialties. Louis Schreiber, 143 Tonnele Avenue, Jersey City, and Louis Rosenhaus, 628 Boulevard, Bayonne, head the company.

Henry Byrne, 392 Mercer Street, Jersey City, N. J., contractor, will build a new one-story, brick machine shop at 396-8 Mercer Street.

The Electro-Dynamic Co., Avenue A, Bayonne, N. J., manufacturer of motors, dynamos, etc., has filed plans for the construction of the proposed one-story addition to its works at Avenue A and North Street, to be 100 x 120 ft. John W. Ferguson, 152 Market Street, Paterson, has the contract.

A. A. Kelley, Montclair, N. J., and associates, have incorporated in Delaware the American Safety Nut Lock Co., with capital of $100,000, to manufacture a special nut lock. Arthur C. Platt and W. J. Arkell, New York, are also interested.

New England

BOSTON, July 16.

The week has been marked by a sudden lull in the demand for machine tools and an absence of inquiries of any size. Reports from machine tool builders indicate that this condition is purely local, as inquiries from their New York and Western agents have increased in volume in the last 10 days. Orders show some increase, which would be much larger if New England factories were not generally sold up for months ahead and in no position to make prompt deliveries outside of Government business.

While Government orders are being held under cover as much as possible by manufacturers who have them, it is becoming known that the number of metal working plants in this section that are turning a large part of their production to Government work is increasing rapidly. Labor shortage is becoming a pressing problem again as the larger industrial centers are responding to the demands of our war program. Bridgeport papers report that there has been a 30 per cent increase in the city's factory payroll in the last two months and that the present weekly payrolls total more than $1,500,000. If figures were available for the other munition and machine tool centers, a corresponding increase would be shown.

The Skinner Chuck Co., New Britain, Conn., has issued additional shares of stock to the value of $100,000. The outstanding stock is $175,000.

The Phelps & Farr Mfg. Co., Woodbury, Conn., has bought a factory formerly used as a silk mill, together with eight employee's houses, and is equipping the plant to make small metal goods. J. W. Phelps, Waterbury, is president and treasurer, and Leon Farr is general manager.

The Portland Shipbuilding Co., South Portland, Me., is beginning the construction of two beam trawlers for the East Coast Fisheries Co. The Portland Co., Portland, will furnish the boilers and engines.

The Moss Pump & Engine Works, Boston, has been incorporated with authorized capital stock of $50,000. The directors are Louis L. Green, president; James W. Moss, 41 South Market Street, treasurer; and C. G. Weld.

The Springfield Carburetor Co., Springfield, Mass., has been incorporated with authorized capital stock of $500,000. The directors are Anton C. Schmelzer, president; Frank W. Arthur, treasurer; and George H. Morgenstern.

The Woburn Machine Co., Woburn, Mass., has awarded a contract for an addition, 40 x 57 ft., one story.

The Steam Motors Co., Springfield, Mass., has been incorporated with authorized capital stock of $25,000. The directors are E. F. Gebhardt, Jr., president; Irving B. Hitchings, Lynn, treasurer; and William J. A. London.

The Universal Grinding Co., 67 Walnut Street, Fitchburg, Mass., has awarded a contract for an addition, 40 x 83 ft., one story, to be used as an erecting room.

The Freeport Shipbuilding Co., Freeport, Me., has been incorporated with authorized capital stock of $100,000 by Julius S. Soule, president; Norman C. Soule and Albert C. Soule.

The Fore River Shipbuilding Corporation, Quincy, Mass., has awarded a contract for a machine shop, 135 x 250 ft., one story, and a boiler shop, 72 x 150 ft., one story.

The New London Ship & Engine Co., Groton, Conn., has awarded a contract for a pipe shop addition, 64 x 117 ft., one story.

Landers, Frary & Clark, New Britain, Conn., have awarded a contract for an addition, 47 x 220 ft., one story.

The Spring Perch Co., Stratford, Conn., is to erect a factory building, 132 x 360 ft., one story.

The Bath Iron Works, Bath, Me., a shipbuilding plant, has been sold by the estate of John S. Hyde, principal owner and for many years president of the company, to a syndicate of Maine bankers, who will develop the property in an effort to help meet the growing demand for tonnage. William T. Cobb, former Governor of Maine, chairman of the Maine Shipbuilding Committee, was elected president of the new corporation, which is said to have contracts to build nine torpedo boat destroyers for the United States Navy at a cost of $10,00,000.

Philadelphia

PHILADELPHIA, July 16.

The H. Belfield Co., 435 North Broad Street, Philadelphia, manufacturer of steam fittings and plumbers' supplies, is having plans prepared for its proposed new plant at Nineteenth, Twentieth and Cambria streets. It will consist of a five-story reinforced-concrete building, 100 x 280 ft.; one-story building of like dimensions, and one-story foundry about 100 x 275 ft. A one-story power plant will also be constructed. The William Steele & Sons Co., 1600 Arch Street, is the architect.

The John Illingworth Steel Co., Tacony and Lewis streets, Philadelphia, specializing in the production of iron and steel bars, has filed plans for the construction of an addition to its machine shop.

The Bureau of Yards and Docks, Navy Department, has awarded a contract for the erection of three new shell houses and four magazine buildings at its Fort Mifflin, Philadelphia, works, to cost about $500,000. J. Henry Miller, Eutaw and Franklin streets, Baltimore, Md., has the contract.

The Niagara Mfg. Co., 323 North Second street, Philadelphia, manufacturer of plumbers' fittings and supplies, has had plans prepared for a one-story and basement addition, about 80 x 80 ft., at 5432 Lancaster Avenue. Frank E. Hahn, 1112 Chestnut Street, is the architect.

The Penn Chemical Works, 1332 Washington Avenue, Philadelphia, will erect a new one-story power house, about 20 x 45 ft., and engine house, 46 x 48 ft., at 1326 Washington Avenue, to cost $22,000.

The DeLong Hook & Eye Co., Broad and Wallace streets, Philadelphia, manufacturer of metal specialties, has awarded contract for the construction of its proposed new plant at Twenty-first and Clearfield streets, at a cost of $160,000, to consist of a four-story reinforced-concrete building, 88 x 225 ft. The William Steele & Sons Co. is the contractor.

The United States Government has awarded a contract for the erection of three new buildings at the Frankford Arsenal, Philadelphia, to comprise a two-story artillery ammunition plant, 50 x 180 ft., with wing 47 x 50 ft., and two one-story structures 47 x 150 ft., and 47 x 47 ft.

The Henry Disston & Sons Co., Tacony, Philadelphia, manufacturer of saws, files, etc., has awarded a contract for the construction of a one-story brick and concrete addition.

The Arguto Oilless Bearing Co., Wayne Junction, Philadelphia, manufacturer of pulleys, bearings, etc., has taken bids for the erection of a new factory at Berkeley and Wayne avenues.

The S. S. White Dental Mfg. Co., Twelfth and Chestnut streets, Philadelphia, manufacturer of dental and scientific instruments, has awarded a contract for the construction of a four-story reinforced-concrete addition, 60 x 75 ft., to its plant at 212-20 South Quince Street. The Turner Concrete Steel Co., 1713 Sansom Street, is the contractor.

The Herez Light Supply Co., Philadelphia, has been incorporated under Pennsylvania laws with a capital of $25,000 to manufacture electric and gas fixtures. Samuel Straussmann, 1523 Poplar Street, is the principal incorporator.

Hord & Co., Inc., 100 Broadway, New York, has announced plans in connection with the acquisition of the property of the Keystone State Fair & Industrial Exposition Co., Middletown, Pa., by the Keystone Industrial Corporation, Harrisburg, Pa., recently organized with a capital of $1,500,000. It is proposed to commence the immediate erection of the first unit of a plant for the manufacture of aeroplanes, hydroplanes, etc., including the production of engines for aircraft. Following the erection of the aeroplane works, it is planned to build a plant for the manufacture of special steam turbine engines for industrial service.

The Hale Fire Pump Co., Conshohocken, Pa., has been incorporated with a capital of $25,000 to manufacture pumping machinery. Everett J. Wendell, Wayne, is the principal incorporator.

Directors of the Lehigh Stove & Mfg. Co., Lehighton, Pa., manufacturer of stoves, heaters, etc., have authorized an increase in the present plant capacity to cost about $60,000.

The Pottstown Steel Plate Products Co., Pottstown, Pa., has commenced the erection of a new plant. F. H. Feister & Co., Pottstown, have the contract.

The O. K. Clutch & Machine Co., Columbia, Pa., manufacturer of hangers, bearings, etc., has taken bids for the construction of a one-story addition, 60 x 130 ft., on Florence Street.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., states that five acres which it recently purchased are not to be used for extensions, but are simply dumping grounds for slag and ashes.

The Benjamin Iron & Steel Co., Hazleton, Pa., is erecting a new iron foundry for general work, and is also building a plant to be devoted to pattern work and the manufacture of mine and stripping cars and steam shovel repair parts. This work was recently announced as being done by the Central Pennsylvania Quarry, Stripping & Construction Co.

The Jeanesville Iron Works, Hazleton, Pa., manufacturer of pumps, has awarded a contract for the erection of a new one-story machine shop, 50 x 335 ft. John G. Brown, Witherspoon Building, Philadelphia, is the contractor. The Worthington Pump & Machinery Corporation, 115 Broadway, New York, operates this company.

The Pusey & Jones Co., Poplar Street, Wilmington, Del., has leased land from the city at Spruce Street and Christiana River. It is reported that the site will be used for an addition to its shipbuilding works.

The Tourgees Specialty Co., Williamsport, Pa., has been incorporated with a capital stock of $10,000 to manufacture incinerators, castings, stampings and forgings. The incorporators are Elizabeth H. Gibbs, C. Edmund Gilmore and Walter C. Gilmore.

The Frankford Machine Co., Philadelphia, has been incorporated with a capital stock of $20,000 to manufacture devices from iron, bronze or brass. The incorporators are Frederick J. Wilkes, 5348 James Street, and others.

The H. A. Bauer Co., Lansdowne, Pa., has been incorporated with a capital stock of $30,000 to manufacture gas and electrical fixtures and supplies. The incorporators are H. A. Bauer, 22 South Lansdowne Avenue, Lansdowne; Guy F. Bauer, 219 South Farragut Terrace, Philadelphia, and James H. Bell, 1815 Land Title Building, Philadelphia.

The Ralph E. Weeks Co., Scranton, Pa., has been incorporated with a capital stock of $200,000 to manufacture plumbers', steamfitters' and tinners' supplies. The incorporators are Ralph E. Weeks, Martin F. Corcoran and Arthur W. Close.

The Penn Electric Service Co., Johnstown, Pa., has commenced the erection of a new power plant at Rockwood to furnish power in the southern part of Somerset County.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has awarded a contract for the erection of a one-story reinforced concrete addition, 20 x 40 ft., to its powerhouse at Delaware Avenue and Robbins Street.

The Quakertown Stove Works, 321 West Broad Street, Quakertown, Pa., has been incorporated with a capital stock of $300,000 to manufacture stoves, heating equipment and castings. The incorporators are William P. Roberts, William P. Winner, Norman H. Moyer, Quakertown, and William B. Conrad, 4419 Uber Street, Philadelphia.

Catalogs Wanted

The Chester Shipbuilding Co., Bristol, Pa., desires to receive catalogs of shipbuilding machinery and equipment. L. W. Carver is general storekeeper.

Baltimore

BALTIMORE, MD., July 16.

Morton McI. Dukehart & Co., 100-102 West Fayette Street, Baltimore, manufacturer of pumps and engines, has been awarded a Government contract for 700 vertical boiler feed pumps and their parts, on a bid of $400,000. Delivery is to be started in five months and to be completed in 16 months. The company acted as agents for the McGowan Pump Co.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg streets, Baltimore, will erect a two-story factory building, 135 x 374 ft., on Wicomico Street near Carey, to cost about $50,000.

The Norfolk & Western Railway Co., Norfolk, Va., will build a 46 x 70-ft. power house.

The H. E. Crook Co., Inc., 28 Light Street, Baltimore, which recently purchased the shipbuilding plant of the McLean Contracting Co., announces that it will not make any additions at the present time. The property comprises a water frontage of about 900 ft and about 600 ft. depth of land, and is improved with a pier about 75 x 500 ft. There are several shop buildings and an office building on the ground. The company has constructed three ship ways and is ready to lay keel. It has been incorporated with $250,000 capital. The officers are: H. E. Crook, president; Clarence H. Crook, vice-president; W. S. Handy, secretary; H. R. Bushman, treasurer.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, is having plans prepared for a two-story addition to its plant, about 46 x 90 ft.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the erection of three new shop buildings at the Charleston, W. Va., navy yard, to consist of a one-story machine shop, 111 x 402 ft., forge and foundry shop, 135 x 562 ft., and heat treating plant, 92 x 150 ft.

The Nox Automatic Air Governor Co., Charleston, W. Va., has been incorporated with a capital of $50,000 to manufacture internal combustion engines and automobile specialties. Wade E. Guthrie, T. C. Townsend, T. S. Clark and T. H. Ballard are the incorporators.

Chicago

CHICAGO, July 16.

No large orders have come to the trade, but the general run of business continues satisfactory. The demand for second-hand tools has been good, especially for heavy machines, more of which are wanted than are available. Manufacturers are in great need of heavy planers.

Shipments on most tools are proceeding in a satisfactory way, indicating that the labor situation at tool-building plants is at least fair, also that cars are more readily obtainable for shipments.

No new munitions orders are reported, but it is known that the Rock Island Arsenal, Rock Island, Ill., must soon require equipment for the large plants on which contractors are at work.

Standard makes of tools are difficult to obtain promptly, especially milling, shaping and grinding machines, radial drills, planers and large turret lathes. Hand-screw machines and the smaller sizes of lathes are easy to find. Horizontal boring and drilling machines are scarce, while some makes of vertical boring mills cannot be had inside of eight months.

Automobile truck manufacturers have found Government specifications for army motor trucks to be extremely rigid, as the trucks are designed for unusually hard service. The requirements are much more severe than those of commercial trucks. New orders will be more easily handled. There is no change in the pleasure automobile industry, and one seller of tools had the situation brought home to him by the cancellation of an order this week. Considerable thought is being given to the effect on labor supply of the draft which is soon to become effective, the general opinion being that it will slow up manufacturing operations until conditions are readjusted.

The Ocean Floating Safe Co., 803 West Madison Street, Chicago, has purchased land at Grand and Kilbourne Avenues, 146 x 221 ft., where it plans to build a factory to cost $70,000 for the manufacture of floating safes. Nenotti Nanni is president.

The Carbo-Hydrogen Co. of America, Pittsburgh, has purchased about three acres in South Chicago, upon which a factory is being built. The cost is estimated at $15,000.

A one-story mill construction factory, 75 x 100 ft., costing about $15,000, is to be constructed at 1650 Walnut Street, Chicago, for Harry I. Holton, real estate, 140 South Dearborn Street.

The Gerlach Barklon Co., Joliet, Ill., will erect a three-story reinforced concrete factory, about 94 x 200 ft.

The Gary Motor Truck Co., Gary, Ind., is installing machinery and soon will begin operations in its new plant with about 50 men. The company started in a temporary plant at Hobart over a year ago.

The Great Lakes Mfg. Co., North Chicago, has been incorporated with a capital stock of $12,000, by H. C. Pomeroy and William A. Witt, Chicago, and Frank N. Tomlinson.

The Midland Electric Steel Co., Chicago, has been incorporated with a capital stock of $10,000 by Joseph S. Samuels, Stanley Filip and R. I. Davis. Associated with the company is J. B. Moos, Lakeview Building, Chicago. Equipment will be supplied by the recently organized Booth-Hall Co., Chicago.

The Twentieth Century Brass Works, Bellevue, Ill., has been incorporated with a capital stock of $25,000 by William Althoff, Henry A. Lengfelder and Walter J. Ruediger.

The Mine Shaft Signal Co., Carrier Mills, Ill., has been incorporated with a capital stock of $10,000 by J. A. Schellenger, Samuel W. Latham and Harry Mandrell.

The Remy Brothers Co., recently organized to manufacture tractors, has leased the buildings and grounds of the Kokomo Foundry & Machine Co., Kokomo, Ind.

The Weaver Mfg. Co., Springfield, Ill., manufacturer of automobile accessories, is about to begin the construction of an addition to its plant. It will be of brick, one story, and cost $15,000.

The Oblong Machine Co., Oblong, Ill., whose business has been principally with oil well companies, is moving its plant to Marietta, Ohio, where there is a greater demand for oil well equipment. The company was established at Oblong at the beginning of the oil boom in that section.

The Besaw Rubber Co., and the Ardmore-Akron Rubber Co., makers of automobile tires, have selected sites along the Santa Fe Railroad at Adrmore, Okla., and are planning new factories.

The Duluth Iron Works, Duluth, Minn., has let a contract for the construction of a foundry with a view of undertaking the manufacture of marine engines.

The Chicago & Eastern Illinois Railroad shops at Danville Junction, Danville, Ill., idle for several years, have been leased to an airplane manufacturing company, which has a Government contract. The shops have five acres of floor space.

The Steamotor Truck Co., Chicago, a Delaware corporation, has increased its capital from $100,000 to $10,000,000 for expansion.

Milwaukee

MILWAUKEE, WIS., July 16.

The past week has been one of the most active in the local machine-tool trade since the declaration of war. Orders for milling machines and other tools on Government account, which required in numerous instances the dispatch of machines by express, are the distinct feature of the week. At the same time the rush for tools by private industries, which had slackened somewhat, again has set in. Inquiries and orders of the week constitute the largest volume of any similar period in three months or more. Government requirements are given precedence, but purchasing on this account has not reached a point where private requirements are yet appreciably affected. On some sizes and types of milling machines, especially the universal, local shops are unable to quote nearer than six or seven months ahead.

Manufacturers in all lines are being warned that it is imperative to order raw materials immediately and to urge their customers to stock up now, as prospects are that after Sept. 1 carriers will be overwhelmed with the business of transporting troops, foodstuffs, ammunition, ordnance and other war necessities, and will have practically no surplus facilities for the ordinary business of the country.

The Globe Seamless Steel Tubes Co., Milwaukee, which is improving and enlarging its plant, will begin first with the erection of a new curing and cooling shop, 50 x 480 ft., of steel and brick, designed by Klug & Smith, consulting engineers, Mack Block. Bids are now being received by the engineers. The cost has not been announced, but is estimated at $100,000 with equipment. F. J. O'Brien is general manager.

A. W. Snyder, Burlington, Wis., is completing the organization of a corporation at Milwaukee to manufacture light castings and automobile parts. It is proposed to erect a foundry and machine shop, 120 x 240 ft., one and two stories, at Greenfield Avenue and Barclay Street, Milwaukee. Mr. Snyder has opened offices on the site and will award contracts within a week or 10 days.

The Milwaukee Auto Engine & Supply Co., 841 Twenty-ninth Street, Milwaukee, has increased its capital stock from $50,000 to $100,000 to accommodate its growing business and to provide for future extensions. John B. McCabe is secretary-treasurer.

The Four Wheel Drive Tractor Co., Clintonville, Wis., is closing bids this week for the erection of the first unit of its tractor and engine manufacturing plant, 70 x 175 ft., one-story, with saw-tooth roof. The company will produce farm and general purpose tractors employing a duplex drive transmission system.

The Fox River Cornice Co., Green Bay, Wis., manufacturing art and corrugated sheet metal goods, is increasing its capacity about 33 per cent and has taken over an adjoining building and installing new equipment. The addition gives the company an area of 66 x 120 ft., with a warehouse, 45 x 90 ft.

The Silent Washer Co., Clintonville, Wis., manufacturer of washing machines, formerly of Appleton, Wis., has plans prepared for a two-story factory, 40 x 120 ft., of reinforced concrete and brick, to cost about $30,000 complete. The Appleton works will be moved to Clintonville as soon as the factory is completed. Robert Fischer is secretary.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., which recently completed work on a new plant, will confine itself to small pumping engines and motor-driven pumps upon the completion of the larger types now being built on order. Frank Mertel has been appointed general manager following the resignation of Fred Ziegahn, who established the works with his son and now returns to Minneapolis, Minn., to engage in the foundry and machine-shop business.

The Langlade Lumber Co., Antigo, Wis., intends to rebuild immediately the roundhouse, machine and blacksmith shops at Bass Lake, Wis., destroyed by fire July 5.

The Sivyer Steel Casting Co., Milwaukee, has awarded the contract for an addition, 150 x 260 ft., to its foundry to the Robert L. Reisinger Co., 1327 First National Bank Building, Milwaukee. A 3-ton electric furnace will be installed, as previously noted.

Westinghouse Church Kerr & Co., New York, have the contract for erecting and equipping a new power plant, costing $40,000, for the Great Northern Railway, Belknap Street, Superior, Wis.

The Mohr-Jones Hardware Co., Racine, Wis., is erecting a shop for working sheet metal. The company recently increased its capital stock from $60,000 to $150,000.

George Freiburger & Sons, New London, Wis., have broken ground for a one-story addition, 50 x 75 ft., to their machine-shop and wagon works.

The Burlington Truck Co., Burlington, Wis., has been organized by members of the Burlington Blanket Co. and will establish a plant in the Ebbers Building to manufacture truck units for Ford chassis.

The Maibohm Wagon Co., Racine, Wis., which engaged in the manufacture of passenger automobiles about a year ago, has reorganized as the Maibohm Motors Co., with a capital stock of $500,000, under a Maine charter.

The Charles Kidd Mfg. Co., Kenosha, Wis., maker of dairy machinery and milk coolers, contemplates moving its plant and offices to Janesville, Wis., where the Commercial Club is raising a fund of $4,000 to defray moving expenses. If the change is made the company will occupy one of the buildings of the Wisconsin Carriage Co., which will be taken over under purchase. It is hoped to start operations in Janesville by Sept. 1.

The Turbo Carburetor Co., Milwaukee, organized six months ago by I. M. Smith and associates, has completed the equipment of a foundry and machine-shop at 150 Clinton Street, and is manufacturing gas engine carburetors. The capital stock is $60,000. Frederick L. Sivyer, head of the Northwestern Malleable Iron Co., is president, and I. M. Smith, general manager.

The Globe Shipbuilding Co., Superior, Wis., incorporated with a capital stock of $50,000, has re-incorporated under Delaware laws with $500,000 capital, divided into $100,000 of 7 per cent preferred and $400,000 common stock. The officers and stockholders remain unchanged. No preferred stock has been issued. The company is rushing work on the equipment of its shipyards and boat construction will begin in about 10 days. Bookings include eight ocean-going trawlers and construction of two ocean-going cargo vessels of the Frederickstadt type will begin immediately. The Globe company has bought the steamer C. S. Barker for $10,000 and will fit it out as a repair-ship. B. C. Cooke is president; C. A. Massey, vice-president, and M. L. McMahon, secretary-treasurer.

The Independent Foundry Co., Milwaukee, organized with $25,000 capital, has elected the following officers: President, Julius Raniszewski; secretary, August Fons; treasurer, Frank Sprader. Contracts will be awarded immediately for the erection and equipment of a gray-iron foundry, 75 x 120 ft., at Fifty-fourth Avenue and Burnham Street, West Allis. The initial investment will be about $20,000.

It is reported that the Racine Rubber Co., Racine, Wis., is preparing to enlarge its steam-generating plant, and will buy a new engine, generator, boiler and automatic stoker equipment. L. Carlson is engineer in charge.

Libby, McNeil & Libby, Chicago, have purchased a site at Ripon, Wis., upon which to build a milk condensing and refrigerating plant costing about $50,000.

The Wisconsin Carriage Co., Janesville, Wis., has changed its style to the Janesville Products Co., and increased the capital stock from $100,000 to $130,000.

The Bukolt Mfg. Co., Stevens Point, Wis., maker of steel-shod tire protectors for motor vehicles and trailers, last week moved into the plant formerly occupied by the

Automatic Cradle Mfg. Co. Its output will be increased tenfold immediately.

Ralph Howland and L. E. Utter, Nashotah, Wis., have organized the Trailer Truck Co., to manufacture a new type of trailer for motor trucks.

Lawrence College, Appleton, Wis., will award contracts soon for the construction and equipment of an addition to the boiler house, 40 x 60 ft., costing $20,000 complete. The architects are Van Ryn & DeGelleke, Caswell Block, Milwaukee.

Peter Beungers, Racine, Wis., has plans for a welding and machine repair shop, to be erected at Eleventh and Villa Streets

The Pan-American Rubber Co., Milwaukee, has been incorporated with a capital stock of $200,000 to manufacture cellular rubber inner tires and tire tools and accessories. A plant has been established at 409-411 Third Street. Joseph Huebner, Sr., is president and general manager.

The Independent Foundry Co., West Allis, has engaged L. M. Gurda, architect, 478 Mitchell Street, to prepare plans for the first unit of its new foundry, to cost about $20,000, with equipment for gray iron production.

The plant of the Thermat & Monahan Co., Oshkosh, Wis., which has been closed since March because of financial difficulties, will be reopened by a reorganization committee representing a new corporation known as the Thermat & Monahan Mfg. Co.

The Federal Rubber Co., Cudahy, Wis., has awarded a contract for a six-story reinforced concrete factory addition, 50 x 295 ft.

A machine shop addition will be erected by the Ransom Mfg. Co., Oshkosh, Wis., manufacturer of disk grinders.

The Boone Tire & Rubber Co., Chippewa Falls, Wis., will spend $200,000 on the construction and equipment of a plant.

The Burlington Brass Works, Burlington, Wis., has closed a contract whereby it becomes the sole manufacturer of the Knudsen patent non-packing valve and other devices invented by J. B. Knudsen and controlled by the Universal Valve Co. The latter company has established offices in Burlington. Frank H. Quail is president of the Universal Valve Co., and Mr. Knudsen vice-president and treasurer. It is expected that the plant of the Burlington Brass Works will soon be enlarged.

The Ampco Shipbuilding Co., Milwaukee, has been incorporated in Delaware with a capital of $1,000,000 to operate a shipbuilding plant. The incorporators are W. H. Gillen and E. E. Warner, both of Milwaukee.

Detroit

DETROIT, July 16.

The machine-tool demand is not strong. An increased number of inquiries and small orders the past week, however, indicates that the market is improving. Big industries are running to capacity, but installing little new equipment until the nature of their output is definitely decided by Government orders. Labor is extremely scarce, and wages are setting a new high record. Deliveries have not improved. Banks are inquiring closely into all loans, and money is not so free, resulting in the establishment of fewer new industries. The Pennsylvania Railway Co. is letting contracts for construction work on its line into Detroit, which, when in operation, will assist greatly in relieving transportation congestion at the Toledo gateway.

The Republic Motor Truck Co., Inc., Alma, Mich., plans immediate construction of an addition to plant No. 2, which will double the capacity and add 100,000 ft. of floor space to the motor division. Charles Rhodes is secretary.

The Higrade Motors Co., Harbor Springs, Mich., manufacturer of ¾-ton trucks, has secured a tract of land in Grand Rapids, Mich., and construction work will be rushed on a factory to be ready for occupancy early in September. J. Elmer Pratt is president.

The Wadsworth Mfg. Co., Detroit, manufacturer of automobile bodies and accessories, has increased its capital stock from $250,000 to $650,000.

The United Refrigerators Co., Detroit, has been incorporated by Thomas J. Clentia and Henry I. Forsythe, with a capital stock of $10,000.

The Wolverine Motors Co., Inc., Kalamazoo, Mich., has been organized to manufacture motor cars. The company is an outgrowth of the Wolverine Detroit Motors Corporation, and is headed by A. H. Collins, formerly with the R. C. H. and Locomobile companies. The capitalization is $125,000.

The Brown Machine Co., Lansing, Mich., manufacturer of machine parts, is building a new plant, into which it will move shortly.

The Detroit Edison Co., Detroit, will build an additional unit to the D. U. R. power house at Monroe, Mich., which it will use for a generating plant. Additional equipment will be installed.

The pipe shop of Murray W. Sales & Co., Detroit, suffered a loss by fire last week, amounting to about $20,000.

The Advance-Rumely Co., Battle Creek, Mich., is arranging to greatly increase its manufacture of oil-pull tractors this year. The force of 400 men now employed will be doubled.

The Daly-Hamlin Mfg. Co., Jackson, Mich., has been organized with a capital of $50,000, to manufacture tractors and parts.

The Campbell Transmission Co., Buchanan, Mich., has been organized, and is erecting a plant to cost $25,000. L. L. Campbell is president.

The National Engineering Co., Saginaw, Mich., has increased its capitalization from $30,000 to $200,000.

The American Cash Register Co., Saginaw, has reorganized and is preparing for an expansion in business.

The United Motors Co., Grand Rapids, Mich., announces it will build a six-ton road tractor. The company is completing an addition to its plant which will be devoted to the building of tractors. The present schedule of production is 200 a month.

The Detroit Pressed Steel Co., Detroit, will erect a four-story addition and make a number of changes in its plant.

The National Twist Drill Co., Detroit, is building a four-story reinforced concrete plant at a cost of $12,000.

The Hoover Steel Ball Co., Ann Arbor, Mich., is contemplating the erection of a number of units of the same type as its present plant.

The Ann Arbor Machine Co., Ann Arbor, is planning to build a new factory.

The Copeman Electric Stove Co., a subsidiary of the Westinghouse Co., will erect a factory at Lapeer, Mich. About 200 employees will be employed at the start.

The Detroit Edison Co., Detroit, is making extensions approximating $2,000,000, to its service. The first unit of a $1,000,000 heating plant is being erected at Congress Street and Cass Avenue, and a $1,000,000 addition to its Connors' Creek plant is also being constructed.

The Doble Detroit Steam Motors Co., Detroit, has been incorporated in Delaware with capital of $10,000,000 to manufacture automobiles, trucks, airplanes, etc. Abner Doble, T. P. Myers and Claud L. Lewis are the incorporators.

It is announced that the Differential Clock Co., capitalized with $400,000, will locate in Muskegon, Mich. The clocks manufactured operate time stamps, time recorders, meters and similar devices. About 150 men will be employed at the start.

Cleveland

CLEVELAND, July 16.

A large volume of new inquiry has come out for machine tools for Government work, much of this being for heavy type machinery for gun making. A number of small lots of machines were placed in Cleveland the past week by Ohio and Detroit manufacturers for work on airplane motors and parts. None of the munition business pending in this section appears to have been placed as yet, and the purchase of the required machinery is awaiting the closing of Government orders. Among the larger inquiries is one from the American Brake Shoe & Foundry Co. for about 240 machines for its Erie, Pa., works for making shells, one for the Erie Forge Co., for machines for making 6-in. guns, and one from an Ohio manufacturer for 60 machines of standard types. There is a fair demand for small lots of machines from motor truck manufacturers, machine tool builders and from other scattered sources.

The White Co., Cleveland, will build an addition, 125 x 500 ft., of brick, steel and reinforced concrete, one and two stories with basement, to be used for a finishing department for motor trucks. Some additional equipment will probably be required.

The Pittsburgh Steamship Co., Cleveland, will enlarge its steamboat repair plant at Erie, Pa., and an adjoining site has been purchased. It will be used particularly for winter repair work. Some machine tool equipment will be required, but it is probable that second-hand machinery will be purchased.

The Cleveland Milling Machine Co., Cleveland, will erect a one-story addition of irregular shape, 100 x 100 x 300 x 15 ft.

The City Machine Co., Cleveland, has purchased a build-

ing site on St. Clair Avenue, near East Fifty-second Street, on which it plans to erect a factory.

The J. C. Ulmer Co., Cleveland, will shortly begin the erection of a new plant at Thirty-eighth Street and Kelly Avenue, where it will move from its present quarters and engage in jobbing machine work and the manufacture of surveying instruments.

The Ideal Tire & Rubber Co., Cleveland, will build a plant to cost $150,000. Plans have been prepared by the Osborn Engineering Co., and the contract awarded to the Hunkin-Conkey Construction Co.

The Hydraulic Pressed Steel Co., Cleveland, will shortly begin the erection of a welfare building, which will involve an expenditure of about $60,000. It will be two stories and basement, 50 x 150 ft., of brick and steel, and will include a restaurant, bowling alleys, and an assembly hall.

The William McClellan File Co., Cleveland, is having plans prepared for a brick and steel factory, two and three stories. It will be built in units, the first being 32 x 190 ft.

The Massillon Steel Casting Co., Massillon, Ohio, has been incorporated with a capital stock of $250,000, and plans the erection of a steel foundry. The incorporators include E. H. Birney, president of the Peerless Drawn Steel Co.; Floyd C. Snyder, F. W. Arnold, Oscar D. Miller and L. M. Taggert.

The American Furnace Engineering Co., Toledo, Ohio, has been incorporated with a capital stock of $10,000 by William E. Galvin, Edward J. Lynch, John A. O'Dyer and others.

The Ohio Wire Goods Mfg. Co., Akron, Ohio, has been incorporated with a capital stock of $100,000 by C. F. Schnee, John C. Grim, Joseph Thomas and others, to manufacture wire goods.

The Defiance Machine Co., Defiance, Ohio, is having plans prepared for an additional factory to provide about 50,000 sq. ft. of floor space.

The Sunlight Electrical Mfg. Co., Warren, Ohio, has been organized with a capital stock of $50,000 to make electrical goods. Among the incorporators are C. L. Wood, C. H. Mills, C. N. Sadler and R. B. Wick.

The Buckeye Aluminum Co., Wooster, Ohio, will enlarge its plant by the erection of a one-story addition, 50 x 150 ft., bids for which will be taken about Aug. 1.

The purchase of the machinery and equipment of the Griffith & Wedge Co., Zanesville, Ohio, by the Mark Mfg. Co., has been concluded, the price paid the receivers being slightly over $77,000. The company has taken a four years' lease on the building, and will install additional equipment. H. L. Fulkerson, formerly general manager of the Griffith & Wedge Co., will be manager.

The Massillon Rubber Co., Massillon, Ohio, will enlarge its plant by the erection of a two-story brick building, 50 x 50 ft.

The Hughes-Kennan Co., Mansfield, Ohio, has closed negotiations with the Bellevue, Ohio, Chamber of Commerce, and will remove its plant to Bellevue and absorb the Klein Iron Works Co. The consolidated company will have a capital stock of $300,000.

Wadsworth, Ohio, will install an ice plant in connection with the municipal light and water plant, and is planning the erection of a filtration plant.

The Atlas Chemical Co., Toledo, Ohio, has been incorporated with a capital stock of $1,000,000, and has acquired the gas plant of the Toledo Railway & Light Co., which will be used for the manufacture of coal tar products.

Pittsburgh

PITTSBURGH, July 16.

Dealers in machine tools and local manufacturers of heavy lathes, planers and other iron and steel working tools believe the Government demand for this equipment over the next six months or a year will be very heavy. Large inquiries have appeared in this market for machine tools from concerns making munitions for the Allies for many months, and now expect to be engaged in making munitions for our own Government over the next year or two. Among local companies with heavy inquiries out for machine tools are the Pressed Steel Car Co., Standard Steel Car Co. and the Westinghouse Electric & Mfg. Co. These firms sold part of their equipment when they finished contracts for munitions for the Allies, and are now compelled to come into the market again and replace many tools. All domestic machine shops and foundries are running to as full capacity as possible, but report a great shortage in the supply of skilled mechanics. The Westinghouse interests are advertising every day in the local papers for men, and have agents out all over the country trying to get skilled mechanics for their different works. The demand for machinery equipment is enormously heavy, and cases have been frequent where companies installing heavy steel works equipment have agreed to pay large bonuses to builders for quick delivery.

The Standard Bridge Tool Co., Fulton Building, Pittsburgh, which for the past 10 years has specialized in the building of the Thomas spacing table and other equipment for handling structural shapes and plates, has been incorporated under a Pennsylvania charter with a total capital of $320,000, and the name of the company has been changed to the Thomas Spacing Machine Co. The company has purchased a site of 19 acres at Glenshaw, Pa., near Pittsburgh, on the main line of the Baltimore & Ohio Railroad, on which a fireproof machine shop is now being built, and will be completed in about 60 days. The equipment has been purchased and most of it delivered. The new shop will have direct switch connection with the Baltimore & Ohio Railroad, and will have excess capacity over its own needs. The company is prepared to contract for work suitable to its equipment. It is installing planers of the following sizes: 72-in. x 48-in. x 16-ft., 64-in. x 48-in. x 30-ft., and 36-in. x 36-in. x 8 ft.; also vertical boring mill 8-ft. heavy pattern, lathes 36-in. x 26-ft., 26-in. x 17-ft., 24-in. x 14-ft., 18-in. x 16-ft., 16-in. x 8-ft., 17-in. x 7-ft., and 14-in. x 8-ft.; turret lathes, 24-in. Gisholts, 4¼-in. bore, Greenlee 3¼-in. bore and Greenlee 2¼-in. bore; drills, 5-ft. Prentiss and 3-ft. Prentiss, and smaller drills. It is also installing shapers, milling machines, universal grinders, cold saw, keyseaters, and a full list of miscellaneous machine shop equipment. In its blacksmith shop it has one No. 3 Nazel forging hammer, with heating and heat treating furnaces. It can also handle light forgings and small tools.

Indianapolis

INDIANAPOLIS, July 16.

The Studebaker Corporation, South Bend, Ind., is erecting a new building at Kendall and Garst streets, to cost $150,000, to be used as a forge room and heating plant.

The Sterling Metal Co., Auburn, Ind., has changed its name to the Sterlite Metal Co.

The Quaker Oil Co., Plainfield, Ind., has been incorporated with $50,000 capital stock to manufacture paints and automobile accessories. The directors are General F. Calbert, Robert G. Edwards and Frank M. Calbert.

The Kokomo Gas & Fuel Co., Kokomo, Ind., has been incorporated with $500 000 capital stock, to furnish light, heat, fuel and power. The directors are A. B. Smith, M. J. Foley, O. C. Johnson, F. L. Blackinton and G. W. Hoss.

The H. N. Ness Co., Indianapolis, Ind., has been incohporated with $5,000 capital stock to manufacture talking machines and musical instruments. The directors are William C. Carroll, Horatio N. Ness and Edwin B. Kenngott.

The Columbus Machine Works, Columbus, Ind., has been incorporated with $25,000 capital stock to manufacture plumbing and heating systems. The directors are Augustus Boyd, Frank P. Boyd and J. R. Dunlap.

The Central South

LOUISVILLE, KY., July 16.

A demand for equipment for small sawmills and woodworking plants has been a recent feature of the market. Motors for use in changing local plants from steam to electric drive are also much sought.

Jacob Weber's Sons, Louisville, have completed an addition to their wagon and motor truck plant, and contemplate further betterments.

The Shawnee Coal Co., Harlan, Ky., will receive bids until July 20 on a 1500-ft. motor-driven air compressor, second-hand, and other coal mine equipment.

The Cambridge Coal Co., Harlan, Ky., will purchase a second-hand hoisting engine, 20 hp., with single drum, and 40-hp. boiler, in good condition for immediate delivery.

Birmingham

BIRMINGHAM, ALA., July 17.

Deliveries continue the chief consideration and worry of machinery dealers. The coal and ore mine equipment business is especially large and general trade conditions are good.

The J. F. Coleman Co., engineers, New Orleans, have options on land worth $470,000 on Mobile Bay, presumably as site for a shipbuilding plant at an estimated cost of $5,500,000. The deepening of the Warrior River to allow ocean-going craft to ply between the Ensley and Fairfield works of the Tennessee Coal, Iron & Railroad Co. and the gulf at Mobile is contemplated.

The United States Marine Co., Brunswick, Ga., will erect a

shipbuilding plant at a cost of $200,000. A. H. Eastmonde and A. G. Lampke, New York, are respectively president and treasurer.

The Florida Shipbuilding Co., Jacksonville, Fla., J. M. Cohlonbach, secretary, will begin the construction of a plant in the immediate future.

The Georgia Railway & Power Co. will build a sixth hydroelectric unit at Tallulah, Ga., at a cost of $330,000 and increasing the capacity by 12,000 hp.

Capt. Rolf Seeberg of the Seeberg Ship Chandlery, Mobile, Ala., announces that Norwegian capitalists will build a shipyard on the Dog River, near Mobile, at a cost of about $2,000,000. The tentative plans for the plant provide for a drydock to accommodate vessels of 10,000 tons, another drydock for the accommodation of smaller vessels, beddings for building steel ships up to 6000 tons, and a foundry, machine shop and boiler shop. The company will be capitalized at $12,000,000 and incorporated in Alabama. The site of the porposed plant embraces 500 acres.

St. Louis

ST. LOUIS, July 16.

The machine tool market continues to show improvement as pressure of business calls for imperative extension or replacement, but only vital requirements are being placed, as there is still a disposition to await the Government's plans. This market is affected by the pressure upon the tool-making facilities from other centers, and delivery inquiries continue to meet with increasingly unsatisfactory replies. Operations of industries in this distrct are very active.

The St. Louis Screw Co., St. Louis, will build a machine shop in connection with its plant.

The Semmelmeyer Belting Co., St. Louis, has been incorporated with a capital stock of $20,000 by J. A. and E. T. Semmelmeyer and E. J. Staube to manufacture belting and mill supplies.

The Surety Mfg. Co., St. Louis, has been incorporated with a capital stock of $25,000 by Leon Weinstein, Edward Henschel and Andrew Wolf to manufacture tools, plates, etc.

The One-Wheel Truck Co., St. Louis, has been incorporated with a capital stock of $35,000 by Otto F. Stifel, H. B. Krenning, Louis Goodhart, and J. D. Howe, to manufacture automobiles, tractors, etc.

The Lasswell & Coble Electric Co., Bernie, Mo., will install about $5,000 worth of machinery, for which it is now in the market.

The City Light & Traction Co., Sedalia, Mo., will improve its electric plant, installing a generating unit to cost complete about $60,000.

The L. M. Machinery Co., Kansas City, Mo., has been incorporated with a capital stock of $50,000 by M. L. McRean, Rene Lindemann and A. R. Neal, to manufacture printing machinery.

The Citizens Ice & Cold Storage Co., Little Rock, Ark., has been incorporated with a capital stock of $50,000 by C. M. Conway, Chris Ledwidge and Stuart Wilson, and will install ice-making and cold-storage equipment.

The Commissioners of Water and Light Improvement, District No. 1, Batesville,, Ark., will install equipment for a filter plant. Frank L. Wilcox, Syndicate Trust Building, St. Louis, is engineer in charge. A daily capacity of 500,000 gal. is contemplated with alternative emergency unit.

The Alva Light & Power Co., Alva, Okla., will increase its capacity, erecting a larger power house and installing additional machinery.

The Cushing Tiger Oil Gas & Refining Co., McAlester, Okla., has been incorporated with a capital stock of $750,000 by Robert N. McMillen, McAlester; W. B. Gray, Montgomery, Ala., and J. L. Wilkie, Anniston, Ala.

The Oklahoma, Kansas & Missouri Interurban Co., H. J. Miller, superintendent, will equip a roundhouse and repair plant at Miami, Okla.

Lawton, Okla., R. T. Sanders, commissioner of public works in charge, will expend a total of $380,000 on water works extension and plant improvement. John D. Kennard is engineer.

L. Waldauer & Son, O'Reilly, Miss., will equip an 8-stand cotton ginning plant at a cost of about $30,000.

The Gulfport Shipbuilding Co., Gulfport, Miss., with capital of $200,000, will equip a plant investing $100,000 in initial installation. Henry Piaggo and B. E. Eaton are chief owners.

The Gulf Shipbuilding Co., Madisonville, La., has acquired yards and will install equipment for the construction of wooden vessels.

The Appalachian Corporation, Louis B. Magid, Atlanta, Ga., president, and James L. Wright, New Orleans, vice-president, will invest approximately $1,000,000 in equipping a cold-storage plant, loading and unloading machinery, electric elevators, etc.

The Richardson Aeroplane Co., New Orleans, La., F. T. Richardson, Hibernia Bank Building, president, will install equipment to manufacture about two tandem hydro-aeroplanes weekly.

Texas

AUSTIN, TEX., July 14.

Several shipbuilding companies that are installing plants at Beaumont, Houston and other Gulf ports of Texas have received contracts to build hulls for the Government. These yards will require considerable machinery and other equipment. The machinery and tool trades show improvement the past week.

The Farmersville Independent Gin Co., Farmersville, will build a cotton gin to cost $12,000. M. W. Stewart is a stockholder.

The Lone Oak Gin & Warehouse Co. will build a cotton gin at Lone Oak to cost $20,000. H. P. Etter is a stockholder.

Beaumont and Port Arthur have approved consolidation of the holdings of the Beaumont Electric Light & Power Co., the Beaumont Traction Co., the Jefferson County Traction Co., and the Port Arthur Light & Power Co., subsidiaries of the Stone & Webster Engineering Corporation. The consolidated interests will install additional machinery in the electric light and power plants and make other improvements.

The Lone Star Shipbuilding Co. has received a contract to build eight wooden hulls for the Government, each to cost approximately $300,000.

The City Commission, San Antonio, will install a sewage pumping station at Camp Wilson to cost $35,000.

The Universal Shipbuilding Co. is clearing the site for a shipbuilding plant bordering the ship channel at Houston and will soon have the work of construction under way. It has obtained the contract for the construction of 12 hulls for the Government, each to cost about $300,000.

James Stewart & Co. have under consideration plans for the construction of a shipbuilding plant at Houston.

The San Antonio Public Service Co., a merger of the San Antonio Traction Co. and the San Antonio Gas & Electric Co., has been incorporated with a capital stock of $4,700,000 and will immediately begin the construction of an extension of its electric railway system to Camp Kelly. It is reported that it will take over franchises of the San Antonio & Austin Traction Co. and carry out the project of constructing an interurban electric railway between San Antonio and Austin, a distance of 85 miles, which involves the erection of a large electric power plant. The new company is controlled by Emerson McMillin of New York and associates.

The Beaumont Shipbuilding & Dry Dock Co., Beaumont, has obtained a contract from the Government to build four wooden ships, each to cost about $300,000. It is preparing a site for the shipbuilding plant, which it will construct at an initial cost of more than $150,000.

The Transcontinental Compress Co., Paris, will rebuild its cotton compress, recently destroyed by fire. The new plant will cost approximately $50,000.

The Cuero Gin Co. will build a cotton gin at Cuero to cost $15,000. C. C. Smith is a stockholder.

The Simmons Gin Co., Memphis, will construct a cotton gin to cost $10,000.

California

LOS ANGELES, July 10.

The Republic Motor Truck Co., Alma, Mich., has acquired factory buildings and 12 acres of land on Santa Fe Avenue, Vernon, near Los Angeles, formerly used by the Pacific Coast Planing Mill Co. The main building, 275 x 450 ft., will be equipped for an assembling plant, with capacity of about 2000 trucks during the coming year; the other structures will be used for general machine and shop work. Pacific coast trade will be supplied from this point. It is said that the initial works will give employment to about 200 hands. The company is also planning for the erection of an addition to its main plant at Alma, to double the present capacity. George W. Moore is secretary and treasurer.

The Los Angeles Galvanizing Co., Palmetto and Carolina Streets, Los Angeles, specializing in galvanizing metals, has arranged for the construction of a new two-story plant, 60 x 120 ft., at Sixth and Mateo streets. Considerable new

machinery will be purchased at once. L. W. Barnett is secretary.

The Cartwright Mfg. Co., Los Angeles, has been incorporated with a capital of $25,000, to manufacture meat cutters, etc. T. P. Cartwright, Charles Hackler and John E. Pitts are the incorporators.

The California Aviation Co., Los Angeles, recently incorporated with a capital of $600,000, is planning for the immediate operation of a plant for the manufacture of aeroplanes. The company has acquired property at Vernon, consisting of existing structures and land for the initial works, which will specialize during the coming months in the production of training machines for Government service and training schools. The present capacity will be one finished machine a day, to be increased to about 10 with the installation of proposed machinery. Earle Remington is general manager. Headquarters have been established at 536 H. W. Hellman Building.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has filed plans for the construction of a new one-story car repair shop, 159 x 160 ft., at 800 Mission Road, to cost about $18,000.

The Hobbs Storage Battery Co., Los Angeles, recently incorporated with a capital of $100,000, has acquired a two-story building at 1231-35 South Olive Street, and will establish a plant for the manufacture of a special storage battery, primarily for motor car service, and is also planning to engage in the manufacture of batteries in larger units. It is said that machinery for the new plant will be purchased at once. A. A. Hobbs is president, and H. V. Andrews an officer.

The California Automatic Sprinkler Co., Los Angeles, has been incorporated with a capital of $10,000, to manufacture automatic sprinklers. M. J. Spencer, P. M. and J. M. Mathews are the incorporators.

The Pacific Pipe & Supply Co., 1007 Santa Fe Avenue, Los Angeles, will build a shop addition at its works.

The Craig Shipbuilding Co., Long Beach, Cal., is said to be negotiating for a site, with waterfront of about 1200 ft., at San Diego, for the construction of a new shipbuilding plant. John F. Craig heads the company.

The Engineering Products Co., representing the Permutit Co. of New York, manufacturer of soft water filters for the prevention of boiler scale, and the R. U. V. Co., of New York, which produces water sterilizers for bacterial purification of water, has opened an office at 251 Rialto Building, San Francisco, with W. D. Forbes as manager.

The Pacific Northwest

SEATTLE, WASH., July 10.

The foreign trade from the port of Seattle, for the fiscal year ended June 30, aggregated $216,000,000, a gain of more than $600,000. Lumbermen in this section will probably furnish most of the spruce required in manufacturing airplanes for the Government. It is estimated that 25,000,000 ft. will be needed. The Hurley-Mason Co., contractor for the American Lake cantonment, has recently placed orders with the lumbermen's association for 10,000,000 ft. of fir lumber.

Collins & Byerly, Ostrander, Wash., have purchased 3000 ft. frontage on the Columbia River, on which will be erected a sawmill to have a daily capacity of 150,000 ft.

Work has begun on the new $35,000 plant of the Capital City Iron Works, Olympia, Wash., which will include machine shops, erecting rooms, pattern storage building, drafting rooms, and a foundry. Work will be completed about Sept. 15, and machinery costing $20,000 will be installed.

The Patterson-Macdonald Shipbuilding Co., Seattle, has completed plans for its new plant, which will occupy 22 acres. The buildings will include a two-story office, costing $6,000; two-story mold loft, 50 x 200 ft., costing $10,000; storehouse, 50 x 50 ft., costing $2,000; blacksmith shop and machine shop.

The Sandstrom Shipbuilding Co., Seattle, has received contract for two wooden hull full-powered ocean-going motorships, costing $800,000, from the Italian Government. It also holds contracts for two vessels for Norwegian interests.

Plans have been completed for the proposed rod and wire mill to be erected by the Anaconda Copper Mining Co., Great Falls, Mont. The plant will be 125 x 400 ft., of brick and steel, and will cost more than $500,000. It will have capacity of 200,000 lb. of copper rods, and 85,000 lb. of copper wire.

The Henrici Reversing Gear & Mfg. Co., Vancouver, Wash., has been incorporated for $5,000, and will erect a factory to manufacture gas engines and a reversing gear. The incorporators are Rudolf Henrici, James E. Keith and Hugh B. Apperson.

Plans have been completed for the proposed plant of the Pacific Marine Iron Works, Portland, Ore. The company holds contracts for 26 marine boilers and 16 engines of 1500 hp. each, totalling $1,500,000. The Supple & Ballin Shipbuilding Co. is principal owner of the iron works.

The Granite-Poorman Mining Co., Nelson, B. C., plans to immediately install a compressor plant, with capacity of 1500 cu. ft. of air, and 300-hp. electric motor.

Olympia Steel Works, Seattle, plans the establishment of new iron foundry on Horton Street, to cost about $5,000 for initial buildings.

The Pacific Scale & Show Case Co., Spokane, states that the report that it has sold its plant to C. J. Reed of that city is not true.

The Nilson & Kelez Shipbuilding Co., Seattle, is constructing a wooden shipbuilding plant on the East Waterway, to cost $250,000. Three initial slips will be built.

The Eagle Brass Foundry, Seattle, has let a contract for a foundry building and pattern shop, 90 x 105 ft., to cost $6,000.

The steel life boat manufacturing plant of Wynkoop Brothers, Portland, which was recently burned, with a loss of $3,500, will be rebuilt at once.

The Stewart Brothers Co., Portland, Ore., has let contracts for two machine shops, 45 x 80 ft. and 40 x 60 ft., respectively. It will manufacture logging and railroad equipment.

The Portland Brazing & Machine Works, Portland, has increased its capital stock to $20,000.

Canada

TORONTO, July 14.

The first steel ocean-going steamer built in Nova Scotia has been successfully launched by the Nova Scotia Steel & Coal Co., New Glasgow, N. S. It has a carrying capacity of about 2000 tons, and has been sold to the British Government. A second vessel about 25 per cent larger, is now under construction, and a third will be begun immediately.

The A. R. Williams Machinery Co., Ltd., 64 Front Street West, Toronto, has issued the following list of machine tools for its requirements: One 90-in. x 20-in. open-side planer; one 84-in. x 20-ft. wall-type traveling tool-head planer; one 72-in. x 20-ft. open-side planer; one 48-in. x 16-ft. planer with side heads; two 84-in. boring mills; one 42-in. boring mill; two 7-ft. plain radial drills; three 6-ft. plain radial drills; one 16-ft. gap or pit lathe; one 1-in. keyseater; one 48-in. x 24-ft. sheared-head engine lathe; one horizontal boring, milling and drilling machine with 5-in. spindles; one 24-in. slotter; one 12-in. slotter; six plain milling machines, one No. 1½, one No. 2, two No. 3, two No. 4 and two No. 5 vertical milling machines; three 3-ft. plain radial drills; one 3-ft. to 4-ft. plain radial drill; four 24-in. to 36-in. x 10-ft. to 12-ft. planers without side heads; three 24-in. vertical boring mills; three 36-in. vertical boring mills; one No. 7 horizontal cylinder-boring machine; one No. 5 horizontal cylinder-boring machine; one 16-in. x 84-in. plain grinder.

The plant of the International Engineering Works, Amherst, N. S., was damaged by fire July 11, with a loss of between $75,000 and $100,000.

The Union Iron Works, San Francisco, is negotiating with the Grand Trunk Pacific Railroad for a two-year lease of the Prince Rupert, B. C., drydock and shipbuilding plant, where it proposes to build 25 steel freighters of 12,000 tons each.

The Montreal Machinery & Supplies, Ltd., Montreal, has changed its title to the Standard Machinery & Supplies, Ltd.

E. Leonard & Sons, London, Ont., will build an addition for the manufacture of engines, boilers, etc., at a cost of $25,000.

The Canadian Copper Co., Copper Cliff, Ont., has commenced the erection of a pumping station in connection with its sewage disposal works.

The Vulcan Iron Works, Vancouver, B. C., will commence at an early date the erection of a machine shop on Industrial Island, to cost $30,000.

The new plant which the International Harvester Co. of Canada is constructing at Hamilton, Ont., is for foundry purposes only, and will provide a place for work which has heretofore been carried on in leased quarters. The company has a wagon factory at Chatham.

The Victoria Talking Machine Co., Ltd., Winnipeg, has been incorporated with a capital stock of $20,000 by J. Horn, J. T. Maloney, May C. Smith, and others, to manufacture musical instruments, talking machines, etc.

The Westbury Electric Light & Power Co., Cookshire,

Que., will build a hydro-electric plant. Construction will be started immediately.

The National Shipbuilding Co., Goderich, Ont., is arranging for the use of the Paget factory at Goderich, as an addition to its plant.

Additions are being made to the plant of the Cameron Genoa Mills Shipbuilder's plant, at Victoria, B. C.

B. A. Saker, Montreal, is making arrangements for the establishment of a shipyard at St. John, N. B., and has secured the Warner Mill property on the river front. Mr. Saker will spend $100,000 equipping and improving the plant to turn out three wooden vessels at the same time. When materials are again available, he will undertake the construction of 3000-ton tramp steamers, and $200,000 more will be spent on the plant.

The McKinnon Dash Co., St. Catharines, Ont., is in the market for 3 air hoists, 3-in. diameter by 4-ft. lift.

McGregor & McIntyre, Ltd., 1139 Shaw Street, Toronto, is in the market for a 300-ton press suitable for nosing 4.5 Howitzer shells, complete with triple pump, accumulator and fittings.

J. C. Wilson & Co., Belleville, Ont., are in the market for a thread miller for nose of 4.5-in., mark 7, shell.

The Canadian Linderman Co., Ltd., Woodstock, Ont., is in the market for a 10 or 7½-hp. motor; three phase, 25 cycle, 550 volt, 750 r.p.m.

E. Drinkwater, 23 Lafayette Boulevard, St. Lambert, Que., is receiving bids for a waterworks plant to be installed at Montreal South, Que., at a cost of $180,000.

The H. Mueller Mfg. Co., River Road, Sarnia, Ont., will soon commence the erection of a brass rolling mill to cost $200,000.

The Electric Products Light & Power Co., will build a brick addition to its plant at Shawinigan Falls, Que., to cost $36,000. R. Lindsay is engineer.

The Three Rivers Shipyard Co., Three Rivers, Que., is completing arrangements for the erection of a shipbuilding plant at Three Rivers to cost $125,000.

The Dominion Products Co., New Westminster, B. C., has let the contract to Booker, Campbell & Whipple, 413 Granville Street, Vancouver, B. C., for the erection of an addition to its plant, to cost $18,000.

The Herbert Morris Crane & Hoist Co. has awarded the contract to the Dominion Bridge Co., 20 Victoria Street, Toronto, for its plant to be erected at Niagara Falls, Ont., at a cost of $80,000. It will manufacture hoists, cranes, etc.

The Swift Canadian Co. has awarded contracts for the erection of a refrigerating plant at Toronto, Ont., to cost $125,000.

The Imperial Munitions Board, Ottawa, Ont., has secured two sites for aerodromes on the Fraser Delta, one of 275 acres on Lulu Island, and the other 300 acres near Boundary Bay, B. C. The former will be developed first. The estimated cost is $3,000,000. Construction work will be carried out by Bate & McMahon, Ottawa, Ont., under the supervision of Col. R. S. Low.

A. B. Jardine & Co., Ltd., Hespeler, Ont., has been incorporated with capital stock of $300,000 by William Jardine, James Jardine, Peter Jardine and others, to manufacture machinery, boilers, tools, implements, etc.

The Motor Products Corporation, Ltd., Walkerville, Ont., has been incorporated with a capital stock of $500,000 by John H. Coburn, Albert J. Gordon, William E. Jones and others, to manufacture iron, steel, copper, motors, engines, etc.

The Canada Emery Wheels, Ltd., Hamilton, Ont., has been incorporated with capital stock of $50,000 by Frank Radigan, George G. Sutherland, Charles Nield and others of Hamilton, to manufacture abrasive material, products, grinding machinery, tools, etc.

The Hosmer Stamping & Die Works, Ltd., Toronto, has been incorporated with capital stock of $10,000 by William Seward, William G. Winchester, Stephen M. Hosmer and others, to manufacture wood and metal products.

H. Stainton, Ltd., Toronto, has been incorporated with capital stock of $40,000 by Herbert Stainton, William A. Michael, William F. Heideman and others, to manufacture electric, gas and waterworks supplies, etc.

The Dominion Distributing Co., Ltd., Hamilton, Ont., has been incorporated with capital stock of $40,000 by Edwin J. Brown, Toronto; Robert H. Simpson, Sanford D. Biggar and others of Hamilton, to manufacture automobiles, parts, accessories, etc.

The Chelsea Green Iron Works, Ltd., Fergus, Ont., has been incorporated with capital stock of $200,000 by William G. Beatty, Wesley L. Ham, Robert D. Kerr and others, to manufacture iron, steel, machine tools, etc. It is building an iron foundry at London, Ont., to cost $50,000.

The Canadian Fasteners, Ltd., Hamilton, has been incorporated with a capital stock of $50,000 by George W. Ballard and Muriel Martin, Hamilton; William Morrison, Burlington, Ont., and others, to manufacture fasteners, hooks, etc.

T. J. Moore, box 122 Wiarton, Ont., is in the market for a 6 ft. x 14 or 16 ft. boiler.

Government Purchases

WASHINGTON, July 16.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until July 31, schedule 1329, for 72 blacksmiths' forges and 62 rivet forges for various points of delivery; schedule 1340, opening date unassigned, for one motor-driven vertical 36-in. turret lathe for Philadelphia; schedule 1341, opening date unassigned, for four high-duty, 24-in. swing drills, ten heavy duty engine lathes with geared headstocks, one motor-driven tool-room lathe, two motor-driven two-spindle flat turret lathes, one horizontal boring and milling machine, one 84-in. boring and turning mill, all for Mare Island, Cal.

Bids will be received by the Bureau of Yards and Docks, Navy Department, Washington, until July 25, specification 2443, for electric traveling cranes for Mare Island, Cal.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, July 6, for supplies for the naval service as follows:

Schedule 1295½, Steam Engineering, Class 21, Philadelphia—Lathes: Bid 15, $2,654; 20, $1,496; 24, $3,225; 29, $2,945; 33, $2,897; 38, $3,105.20; 39, $900; 42, $2,975.

Class 22, Philadelphia—Lathes: Bid 15, $3,566; 24, $4,000; 29, $3,835; 30, $3,100 and $3,165; 33, $3,897; 38, $4,329.75; 42, $3,250.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, on July 10 for supplies for the naval service as follows:

Schedule 1289, Steam Engineering, Class 61, Philadelphia—One milling machine: Bid 56, $4,710; 72, $3,548.

Class 62, Philadelphia—One milling machine: Bid 56, $4,530; 72, $4,130.

Class 63, Philadelphia—One slotting machine: Bid 44, $8,780; 47, $12,240.

The names of the bidders and the numbers under which they are designated in the above list are as follows:

Bid 15, The Fairbanks Co.; 20, Kemp Machinery Co.; 24, Manning, Maxwell & Moore, Inc.; 29 and 44, Niles-Bement-Pond Co.; 30, D. Nast Machinery Co.; 33 and 56, W. E. Shipley Machinery Co.; 38, Vandyck-Churchill Co.; 39, Ward & Co.; 42, Swind Machinery Co.; 47, Newton Machine Tool Works, Inc.; 72, Brown & Sharpe Mfg. Co.

Bids were received by the Bureau of Yards and Docks, Navy Department, Washington, on July 9, under specification 2444, for furnishing electric traveling cranes for New York as follows:

Item 1, two 15-ton bridge cranes, complete; 2, add for each additional bridge crane up to four.

Penn Bridge Co., Washington, item 1, $49,887, 250 days; 2, $24,375, 14 days for each additional crane. Morgan Engineering Co., Alliance, Ohio, item 1, $63,830, 260 days. Cleveland Crane & Engineering Co., Wyckliff, Ohio, item 1, $59,320, 180 days; 2, $29,660, 30 days additional for each crane. Pawling & Harnischfeger, Milwaukee, Wis., item 1, $44,599, 300 days; 2, $22,250, 30 days. Niles-Bement-Pond Co., 111 Broadway, New York, item 1, $40,750 365 days; 2, $20,375 each, 400 days.

Bids will be received by the Navy Department until July 25 for purchases of old material consisting of 3,000,000 lb. of brass foundry ashes to be removed as accumulated up to Dec. 31, and until Aug. 9 for purchases of old material consisting of engines, machine tools, ice machines, air compressors, oil testing machines, 1,000,000 lb. scrap steel, 30 tons boiler tubes, 100 tons iron and steel borings, and 700 tons scrap iron and steel. The schedules containing form of proposal and terms of sale may be obtained from the Supply Office, Navy Yard, Washington.

J. J. Harty, vice-president of the Canadian Locomotive Co., Kingston, Ont., states that the business of the company is excellent, and that the plant is running to capacity and has orders on hand that will keep it busy until next March. An order for 6 switching engines for the Toronto, Hamilton & Buffalo Railway, weighing about 166,000 lb., has just been closed.

The Granite City Steel Works and the plant of the National Enameling & Stamping Co., at Granite City, Ill., which has been closed pending the annual settlement of the wage scale, resumed operations full force July 14. The two plants employ about 3,800 men.

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